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Revision 2

U.S. Department of Energy
Idaho Operations Office

New Pump and Treat Facility Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B

June 2007

Idaho Cleanup Project

DOE/ID-10679
Revision 2
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Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office

ABSTRACT

This remedial action work plan identifies the approach and requirements for implementing the medial zone remedial action for Test Area North, Operable Unit 1-07B, at the Idaho National Laboratory. This plan details the management approach for the construction and operation of the New Pump and Treat Facility (NPTF). As identified in the remedial design/remedial action scope of work, a separate remedial design/remedial action work plan will be prepared for each remedial component of the Operable Unit 1-07B remedial action.

This work plan was originally prepared as an early implementation of the final Phase C remediation. At that time, the Phase C implementation strategy was to use this document as the overall Phase C Work Plan, and the document was to be revised to include the remedial actions for the other remedial zones (hotspot and distal zones). After the completion of *Record of Decision Amendment: Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites, Final Remedial Action*, it was determined that each remedial zone would have its own stand-alone remedial action work plan.

Revision 1 of this document converted the document to a stand-alone remedial action work plan specific to the implementation of the NPTF used for plume remediation within the medial zone of the Operable Unit 1-07B contaminated plume. Revision 2 of this document revises the NPTF operating strategy based on results obtained during the NPTF Medial Zone Rebound Test conducted from March 1, 2005, through March 5, 2007.

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ACRONYMS

ACC	acceptable ambient concentration
ANP	aircraft nuclear propulsion
ARAR	applicable or relevant and appropriate requirements
ASTU	Air Stripper Treatment Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
CWI	CH2M-WG Idaho, LLC
D&D	decontamination and decommissioning
DCE	dichloroethene
DEQ	(Idaho) Department of Environmental Quality
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EA	emergency action
EL	emission level
EPA	U.S. Environmental Protection Agency
ESD	explanation of significant differences
FDR	field demonstration report
FFA/CO	Federal Facility Agreement and Consent Order
FY	Fiscal Year
GWTF	Groundwater Treatment Facility
HASP	Health and Safety Plan
HVAC	heating, ventilating, and air conditioning
HWMA	Hazardous Waste Management Act
ICP	Idaho Cleanup Project

IDAPA	Idaho Administrative Procedures Act
IDP	Interim Decontamination Plan
IDHW	Idaho Department of Health and Welfare
INEEL	Idaho National Engineering and Environmental Laboratory
INL	Idaho National Laboratory
ISB	in situ bioremediation
ISMS	Integrated Safety Management System
LDR	land disposal restriction
MCL	maximum contaminant level
MNA	monitored natural attenuation
NA	natural attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NLCID	no-longer-contained-in determination
NPTF	New Pump and Treat Facility
O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration
OU	operable unit
PCE	tetrachloroethene
PM/CM	performance/compliance monitoring
RA	remedial action
RAO	remedial action objective
RAWP	remedial action work plan
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action

RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SO	system operational
SOW	Scope of Work
TAN	Test Area North
TBD	to be determined
TCE	trichloroethene
TSF	Technical Support Facility
VOC	volatile organic compound
VPP	Voluntary Protection Program
WAG	waste area group
WMP	Waste Management Plan
WRRTF	Water Reactor Research Test Facility

New Pump and Treat Facility Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B

1. INTRODUCTION

This remedial action work plan (RAWP) is prepared in accordance with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991) by the U.S. Department of Energy Idaho Operations Office (DOE-ID). This plan addresses the implementation of the medial zone remedial component (New Pump and Treat Facility [NPTF]) of the Operable Unit (OU) 1-07B remedial action at Test Area North (TAN) Technical Support Facility (TSF) injection well, TSF-05; and surrounding groundwater contamination, TSF-23. This Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.) remedial action will proceed in accordance with the signed *Record of Decision, Declaration for the Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites Final Remedial Action, Operable Unit 1-07B, Waste Area Group 1* (DOE-ID 1995), hereinafter referred to as the OU 1-07B or 1995 Record of Decision (ROD); and in accordance with the signed *Record of Decision Amendment: Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites, Final Remedial Action* (DOE-ID 2001a), hereinafter referred to as the OU 1-07B or 2001 ROD Amendment.

The scope of the complete OU 1-07B final remedial action is described in the remedial design/remedial action (RD/RA) scope of work (SOW), which includes the *Remedial Design Remedial Action Scope of Work Test Area North Final Groundwater Remediation Operable Unit 1-07B* (DOE-ID 1997) and *Remedial Design/Remedial Action Scope of Work* (DOE-ID 2001b).

The OU 1-07B ROD states that the selected remedy will be conducted in three phases, as follows: (1) Phase A—Transition of OU 1-07A Interim Action to OU 1-07B Final Remedial Action, (2) Phase B—Hot Spot Containment and/or Removal with Treatability Studies, and (3) Phase C—Dissolved Phase Groundwater Treatment with Continuation of Hot Spot Containment and/or Removal. The Phase A transition period was completed in 1995, and signified the end of the OU 1-07A interim action.

During Phase B, the Groundwater Treatment Facility (GWTF) was operated to provide source containment. Treatability studies also were conducted and showed that the use of monitored natural attenuation (MNA) and in situ bioremediation (ISB), in combination with pump-and-treat, could clean up the contaminant plume in less time and at a lower cost than the original remedy selected in the 1995 ROD. The 2001 ROD Amendment documents these changes and has been approved by the regulating Agencies (i.e., DOE-ID, U.S. Environmental Protection Agency [EPA], and Idaho Department of Environmental Quality [DEQ]). Based on approval of the ROD Amendment, Phase B has been officially completed and the project now is into full-scale implementation of Phase C.

Prior to the completion of Phase B, "early implementation of Phase C" began with the construction of the New Pump and Treat Facility (NPTF), which is used to treat groundwater from within the medial zone.

1.1 Overall Remedial Action Summary

Phase C represents the final implementation of the remedial actions selected for each of the remedial zones within the OU 1-07B contaminated plume. The final remedy is required to be complete in no more than 100 years from the original ROD signature date, and will end when the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) review process demonstrates that remedial action objectives (RAOs) have been met.

As described in the *Explanation of Significant Differences from the Record of Decision for the Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites, Final Remedial Action, Operable Unit 1-07B, Waste Area Group 1, Idaho National Engineering and Environmental Laboratory* (INEEL 1997) and the associated RD/RA Scope of Work (SOW) (DOE-ID 1997), the final remedy assumed implementation of the default pump and treat remedy to include separate pump and treat systems in each of the three treatment zones. The three zones are shown in Figure 1-1 and are defined based on the 1997 trichloroethene (TCE) concentration as follows:

- Hot spot (greater than 20,000 μg/L TCE)
- Medial zone (dissolved phase 1,000 to 20,000 μg/L TCE)
- Distal zone (dissolved phase 5 to 1,000 μg/L TCE).

Based on the treatability studies, and as agreed to in the 2001 ROD Amendment (DOE-ID 2001a), the final remedy replaced the pump and treat systems that were to be placed in the hot spot and distal zones with alternative technologies. The final selected technologies to be used for the final remedial actions were changed to the following:

- Hot spot—In situ bioremediation (ISB)
- Medial zone—Pump and treat (using the NPTF)
- Distal zone—Monitored natural attenuation (MNA).

At the time of the 2001 ROD Amendment, it was determined that separate work plans would be prepared for each of the different treatment zones. This work plan will provide the controlling documents for the medial zone (New Pump and Treat Facility).

1.2 New Pump and Treat Facility Remedial Action Approach

A separate remedial design, the *New Pump and Treat Facility Remedial Design Test Area North Operable Unit 1-07B* (DOE-ID 2000), was prepared and approved by the Agencies, specifying the configuration of the NPTF. The remedial design and RAWP are built upon the planning elements established in the RD/RA SOW and Explanation of Significant Differences (ESD) (DOE-ID 1997, INEEL 1997), and they carry those elements through the design and implementation of the remedy. Supporting the remedial design and RAWP are associated documents including the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Groundwater Remediation Operable Unit 1-07B* (DOE-ID 2007), the Sampling and Analysis Plan (SAP) (Appendix A of the NPTF Operations and Maintenance [O&M] Plan), *Waste Management Plan for Test Area North Final Groundwater Remediation* (INEEL 2005a), *Interim Decontamination Plan for Operable Unit 1-07B* (INEEL 2002), and the approved Health and Safety Plan (HASP)—*Test Area North Operable Unit 1-07B Final Groundwater Remedial Action Health and Safety Plan* (INEEL 2005b).

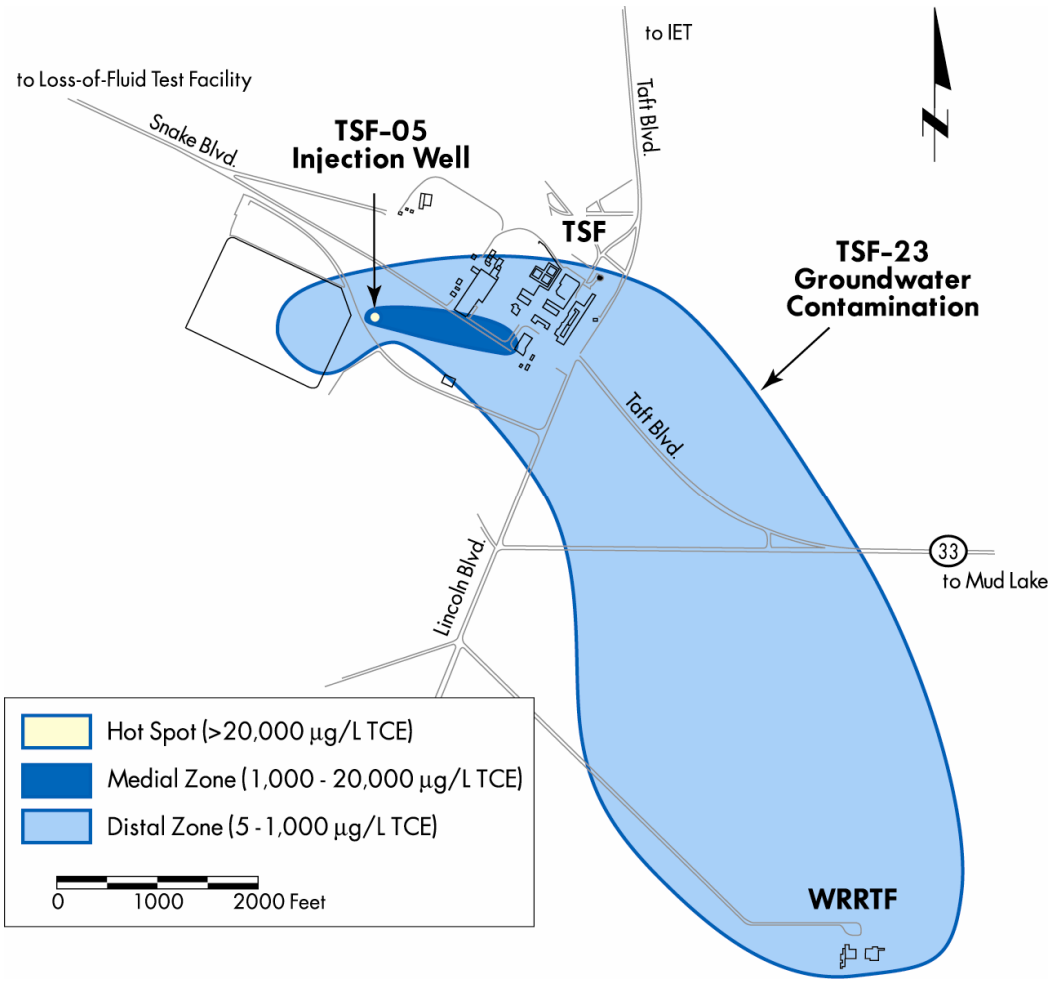

Figure 1-1. Operable Unit 1-07B trichloroethene contaminant plume.

Implementation of the remedial action for the medial zone was initiated through the design, construction, and operation of the NPTF. As described in the ESD, the construction and operation of the NPTF was considered early implementation of Phase C.

1.2.1 Medial Zone Implementation Activities

The planned medial zone remedial activities are identified below. The activities under item 1 are addressed in this RAWP, and the activities under Items 2 through 6 are addressed in the NPTF O&M Plan (DOE-ID 2007) as long-term O&M activities:

1. New facility construction—NPTF:
   a. Design
   b. Construction
   c. Startup, system operational (SO) testing, and agency prefinal inspection
   d. Initial operations and shakedown
   e. Final inspection and remedial action report.

2. NPTF:

    a. Operations and maintenance

    b. Compliance inspection

    c. Waste management.

3. Remedy performance monitoring:

    a. Compliance monitoring

    b. Long-term performance monitoring (remedial action objective performance evaluation—support site conceptual model update)

    c. Groundwater monitoring (plume dynamics monitoring).

4. Five-year reviews and O&M report:

    a. Five-year reviews

    b. O&M report.

5. Institutional controls.

6. Decontamination and dismantlement.

1.2.2 ROD Amendment Implementation Changes

The ROD Amendment (DOE-ID 2001a) for the OU 1-07B remedial action was developed and approved in 2001. With this amendment, the following applicable or relevant and appropriate requirements (ARARs) previously applicable to the NPTF were deleted because they no longer apply:

- 40 CFR 264, Subpart X, *Miscellaneous Units*
- 40 CFR Subpart AA, *Air Emission Standards for Process Vents*
- DOE Order 5480.7A, *Fire Protection.* DOE Order 5480.7A was cancelled by DOE. It has been superseded by DOE 420.1, *Facility Safety.* Appropriate measures will be taken for worker safety.
- DOE Order 5820.2A, *Radioactive Waste Management.* DOE Order 5820.2A was canceled by DOE Order 435.1, *Radioactive Waste Management,* on July 9, 1999.

In addition to the deleted ARARs, the following clarifications were made as to the application of ARARs to NPTF operations:

- The Agencies do not intend to reinject radionuclides above maximum contaminant levels (MCLs)
- The TCE in the contaminated groundwater is a listed waste. Therefore, all components on the influent side of the treatment system, including the air stripper equipment, have been designed to meet the secondary containment requirements of Code of Federal Regulations (CFR) 40 CFR 264, Subpart J, of the Resource Conservation and Recovery Act (RCRA). After the air stripping process, the concentrations of hazardous constituents in groundwater will be less than the applicable MCL and will result in a cumulative carcinogenic risk of less than 1×10^{-5}. As a result, a no-longer-contained-in determination is applicable and the NPTF effluent is no longer considered a listed hazardous waste.

1.3 Medial Zone–New Pump and Treat Facility

The medial zone remediation includes operation of the NPTF with extraction wells located approximately 610 m (2,000 ft) downgradient from the TSF-05 injection well. The purpose of the NPTF is to capture and treat groundwater between the hot spot containment zone and the medial zone extraction wells. The facility operates at between 454 and 946 L/min (120 and 250 gpm). Based on data collected at the extraction location, influent radionuclide concentrations are below maximum contaminant levels (MCLs), and thus the system does not require radionuclide removal treatment.

1.3.1 New Pump and Treat Facility System Description

The NPTF consists of the equipment and piping needed to pump water from Wells TAN-38, -39 and -40, process the water through two parallel air stripper treatment trains with a maximum capacity of 473 L/min (125 gpm) each, and discharge the effluent water into a downgradient injection well (TAN-53A). The system pumps water from a combination of the wells at a minimum flow rate of 454 L/min (120 gpm). This water is treated, using air strippers, to below MCLs for volatile organic compounds (VOCs). The extracted groundwater is considered F001-listed waste and all components of the extraction system will meet secondary containment requirements required by 40 CFR 264 Subpart J. After the air stripping process, the water is (through approval of the DEQ) considered to no longer contain the listed hazardous waste and is discharged to the injection well without having to comply with the secondary containment requirements.

1.3.2 New Pump and Treat Facility Process System Requirements

The NPTF process flow is depicted in Figure 1-2. The following is a summary of design parameters established as functional and operational requirements used during the design of the NPTF:

- The system will pump and treat water at a normal minimum operating flow rate of 454 L/min (120 gpm), with the capability for processing up to 946 L/min (250 gpm).
- The system will be capable of extracting water separately or in combination from any of the Wells TAN-38, -39, and -40. The water will be reinjected into a new downgradient well.
- The system will be capable of operating 24 hours/day, 7 days/week, while maintaining a facility uptime of ≥90% over a 1-year period.
- The system will be designed for unmanned operation. For design purposes, the maximum length of time needed for unmanned operation is 4 days.
- The facility will have a 25-year design life. (The facility will be replaced as necessary thereafter.)
- The air stripper must remove the VOCs in the extracted water to below the set MCL. Based on the sampling results obtained during the well characterization and evaluation activities, the design influent concentrations for VOCs are as shown in Table 1-1 (INEEL 1998). In order to meet MCLs, the air stripper must obtain a minimum removal efficiency of 99.6%.
- The VOCs remaining in the effluent water must result in a cumulative carcinogenic risk less than 1×10^{-5}.
- The system will not provide treatment for radionuclide removal.

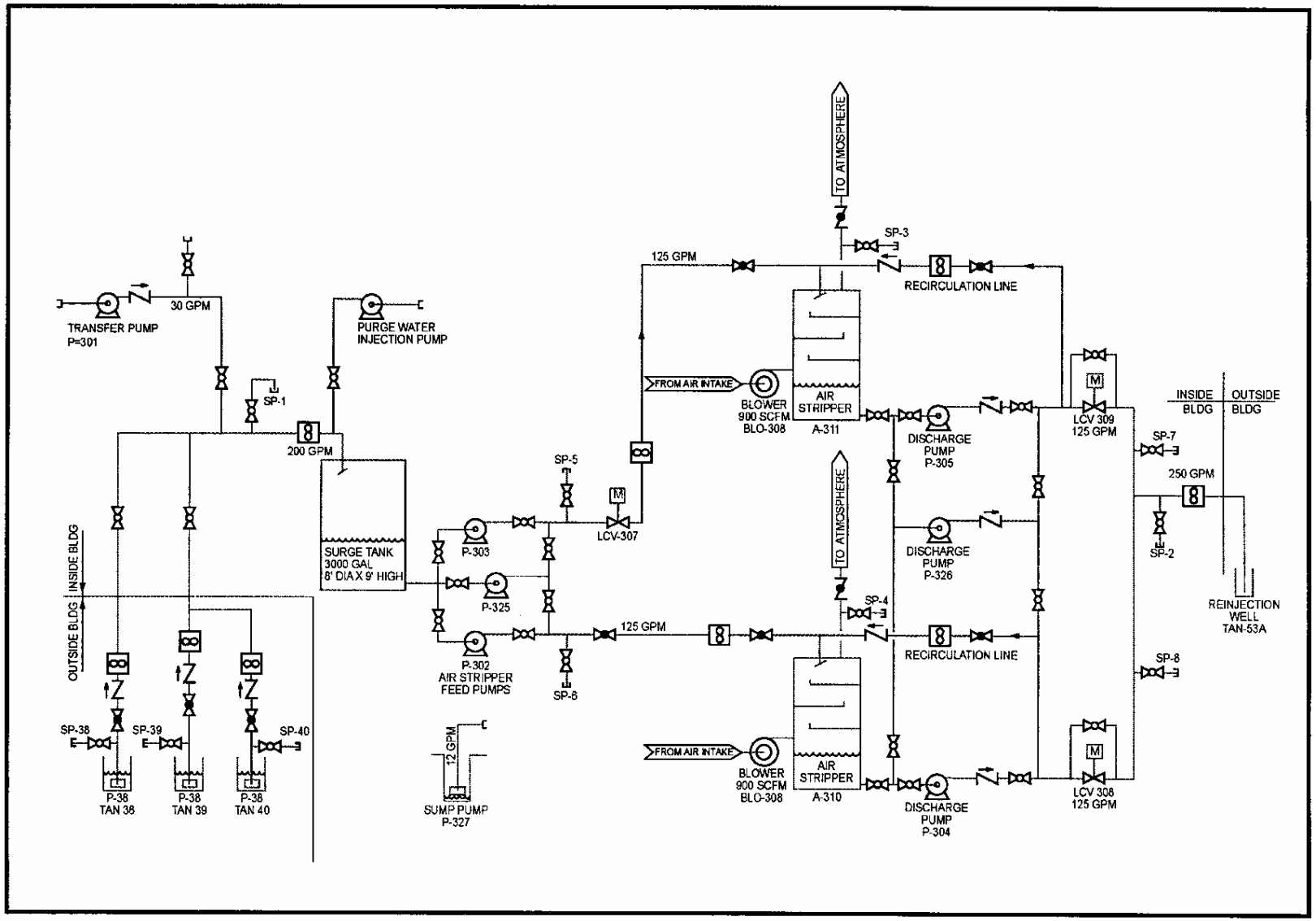

Figure 1-2. New Pump and Treat Facility process flow.

Table 1-1. Influent concentration.

Contaminant	Concentration (µg/L)	MCL (µg/L)
TCE	1,100	5
PCE	70	5
cis-DCE	120	70
trans-DCE	50	100

DCE = dichloroethene
MCL = maximum contaminant level
PCE = tetrachloroethene
TCE = trichloroethene

1.4 Performance and Compliance Monitoring

The purpose of performance and compliance monitoring is to monitor the contaminants of concern (COC) concentration changes over time, verify compliance with the ARARs, and evaluate attainment of RAOs. The scope and requirements for performance and compliance monitoring in the medial zone are addressed in the NPTF O&M Plan (DOE-ID 2007).

Water monitoring for the NPTF will be performed in accordance with the SAP (Appendix A of the O&M Plan [DOE-ID 2007]) developed for the NPTF. The NPTF SAP will consider and support the RAOs identified in the ROD Amendment (DOE-ID 2001a) specific to ARAR compliance for the NPTF. The *Monitored Natural Attenuation Operations, Monitoring, and Maintenance Plan for Test Area North, Operable Unit 1-07B* (DOE-ID 2003) will support upgradient source control monitoring. Data obtained from MNA monitoring will be used to evaluate the presence of upgradient anomalies that could possibly impact NPTF operations.

1.5 Institutional Controls

Institutional controls will consist of engineering and administrative controls to protect current and future users from health risks associated with groundwater contamination by preventing ingestion of groundwater having concentrations of COCs exceeding MCLs or a cumulative risk level of 1×10^{-4}. The scope and requirements for institutional controls are addressed in Section 6 of the NPTF O&M Plan (DOE-ID 2007) and these institutional controls will be maintained in accordance with the INL Sitewide Institutional Controls Plan (DOE-ID 2006a).

1.6 NPTF Medial Zone Rebound Test Results and Future Operational Strategy

The NPTF Medial Zone Rebound Test was performed to assess the overall impact of NPTF operations on remediation of the medial zone. Operation of the NPTF for ~3.5 years (October 2001 to March 2005) demonstrated a decrease in TCE concentrations to approximately 100 µg/L, which is an order of magnitude reduction below the Record of Decision-defined medial zone concentration of 1,000 µg/L. The NPTF medial zone rebound test was conducted from March 1, 2005, to March 5, 2007. Based on the results obtained during the rebound test and after several discussions with the Agencies, the operational strategy of the NPTF will be modified as outlined below:

1. The NPTF will be operated during scheduled work days Monday at 9 a.m. to Thursday at 4 p.m. (79 hours per week) and will be placed into standby mode during weekends and holidays.

2. At the end of each work week, the NPTF will be placed in standby and the system will be flushed with potable water. See Section 3.2.12 of the NPTF O&M Plan (DOE-ID 2007).

3. Groundwater samples will be collected monthly from five locations (three medial zone wells, one upgradient well, and at the NPTF influent) to monitor VOC concentration trends.

4. NPTF operations will continue until TCE concentrations at three medial zone monitoring wells (TAN-33, TAN-36, and TAN-44) are less than 100 µg/L. When this occurs, the NPTF will then be placed in prolonged standby mode until TCE concentrations increase to 200 µg/L in any of the three medial zone monitoring wells. At this point, NPTF operations will resume as stated in 1 and 2 above, and in Section 3.1.1 of the NPTF O&M Plan (DOE-ID 2007).

5. Compliance monitoring of NPTF influent water, effluent water, and air will be completed on a quarterly basis as described in the NPTF O&M Plan (DOE-ID 2007).

6. Bis-chloromethylether will be deleted from the analyte list as a best management practice to reduce monitoring costs. All samples analyzed for bis-chloromethylether since the start of sample collection through present showed undetect results. Also, bis-chloromethylether analysis requires collection of an additional 1 liter of sample volume and performance of a separate analytical method.

The purpose, objectives, and design of this test are described in the *New Pump and Treat Facility Medial Zone Rebound Test Plan, Operable Unit 1-07B, Test Area North* (Wymore et al. 2004). Groundwater samples were collected in accordance with the *Sampling and Analysis Plan for the New Pump and Treat Facility Medial Zone Rebound Test, Operable Unit 1-07B, Test Area North* (ICP 2004). The NPTF rebound test results are presented in the NPTF Annual Reports (ICP 2005, ICP 2007). The revised scope and requirements for performance and compliance monitoring in the medial zone are addressed in the NPTF O&M Plan (DOE-ID 2007).

For the purposes of this document and other ancillary documents, the NPTF operating cycle is defined as the period of time in which the NPTF is actually required to process water to reduce contamination in the medial zone. This will be the period of time in which the NPTF operates from Monday at 9 a.m. to Thursday at 4 p.m. (79 hours) during each week to reduce TCE concentrations from 200 to 100 µg/L as measured at TAN-33, TAN-36, and TAN-44. For this period of time, a facility uptime of $\geq$90% will be maintained.

2. REMEDIAL ACTION OBJECTIVES AND AGENCY REVIEW OF REMEDY EFFECTIVENESS

As part of the remedial investigation/feasibility study (RI/FS) process, RAOs were developed in accordance with the NCP and EPA guidance for conducting RI/FS investigations. The purpose of the objectives is to reduce the contamination in the groundwater at TAN to ensure that off-Site populations are not at risk in the future, and that future residents would not be at risk from use of TAN groundwater if the TAN area were converted to the public domain at any time in the future. The RAOs for Phase C, as specified in the OU 1-07B 1995 ROD, include the following:

- Prevent, to the maximum extent practicable, migration of contaminated groundwater beyond the hot spot at levels above MCLs, or for those contaminants for which an MCL does not exist, the contaminant concentration will be such that the total excess cancer risk posed by release of contaminated groundwater will be within the acceptable range of 1.0E-04 to 1.0E-06. For above-ground treatment processes using reinjection of treated effluent, treatment shall, at a minimum, be sufficient to reduce the VOC concentration to below MCLs. The VOCs discharged to the atmosphere from hot spot treatment operations will not exceed the calculated emission rate limits specified in Table 9-1 of the 1995 ROD (DOE-ID 1995).

- Capture and treat a sufficient portion of the dissolved phase plume beyond the hot spot to provide for aquifer cleanup within 100 years of the date of the ROD signature. For above-ground treatment processes using reinjection of treated effluent, treatment shall be designed to reduce the VOC concentration to below MCLs. If an MCL does not exist, the contaminant concentration will be such that the total excess cancer risk posed by the groundwater will be within the acceptable range of 1.0E-04 to 1.0E-06. The VOCs discharged to the atmosphere from GWTF operations will not exceed the calculated emission rate limits specified in Table 9-1 of the 1995 ROD.

- Institutional controls shall be implemented to protect current and future users from health risks associated with ingestion of groundwater containing COC concentrations greater than MCLs or 1.0E-04 to 1.0E-06 risk-based concentrations for contaminants without MCLs. Institutional controls shall be maintained until COC concentrations fall below MCLs or 1.0E-04 to 1.0E-06 risk-based concentrations for contaminants without MCLs.

Changes to the final RAOs were made in the 2001 ROD Amendment. The Agencies agreed to the following final RAOs for the entire contaminant plume:

- Restore the contaminated aquifer groundwater by 2095 (100 years from the signature of the 1995 ROD) by reducing all COCs to below MCLs and a 1×10^{-4} total cumulative carcinogenic risk-based level for future residential groundwater use and, for non-carcinogens, until the cumulative hazard index is less than 1.

- For above-ground treatment processes in which treated effluent will be reinjected into the aquifer, reduce concentrations of VOCs to below MCLs and a 1×10^{-5} total risk-based level.

- Implement institutional controls to protect current and future users from health risk associated with ingestion or inhalation of or dermal contact with contaminants in concentrations greater than the MCLs, or greater than a 1×10^{-4} cumulative carcinogenic risk-based concentration or a cumulative hazard index of greater than 1, whichever is more restrictive. The institutional controls shall be maintained until concentrations of all COCs are below MCLs, and until the cumulative carcinogenic risk-based level is less than 1×10^{-4}, and, for non-carcinogens, until the cumulative hazard index is less than 1. Institutional controls shall include access restrictions and warning signs.

2.1 Remedy Monitoring

Remedy monitoring will be implemented to ensure that the selected remedy will meet all RAOs as identified above. The monitoring strategy for the medial zone is outlined in Table 2-1. This monitoring is divided into compliance and performance monitoring. The performance and compliance sampling results will be used to support agency 5-year reviews for evaluation of remedy performance.

Although the monitoring activities outlined in this RAWP are specific to the medial zone, groundwater sampling activities in support of other OU 1-07B remedial components coincide with those for the NPTF. Table 2-2 identifies all the compliance and performance monitoring activities that will be performed in association with the three monitoring zones.

2.1.1 Performance Monitoring

The performance monitoring strategy is divided into two components:

1. Upgradient source control monitoring—To provide early warning of groundwater anomalies that could possibly impact the performance of the NPTF.

2. Plume capture monitoring—To assure that a sufficient portion of the plume is being captured and treated so that medial zone cleanup can be completed by 2095. This monitoring also will be used to assess NPTF operational status; it will either be used to place the NPTF in standby when TCE concentrations at TAN-33, TAN-36, and TAN-44 are below 100 µg/L or to restart the NPTF when TCE concentrations rebound to 200 µg/L at TAN-33, TAN-36, or TAN-44.

The above strategies are discussed in the following sections.

2.1.1.1 Upgradient Source Control Monitoring. In order to provide early warning of groundwater anomalies that could impact the NPTF's ability to meet established discharge criteria, the project team will review VOC and radionuclide concentration data collected at TAN-28, TAN-29, and TAN-30A. If the data show that there are increasing concentration trends moving downgradient toward the NPTF, then an evaluation will be performed to determine and implement operational controls within the NPTF to ensure that the treated water will meet the NPTF operational requirements. As stated in the ROD Amendment (DOE-ID 2001a), the contingency remedy would involve operation of the existing Air Stripper Treatment Unit (ASTU) to extract groundwater from a well upgradient of the NPTF, treat the contaminated water through air stripping to remove VOCs, and reinject the treated water in an injection well located upgradient near the hot spot to facilitate sorption of radionuclides onto subsurface soil and rock. Wells TAN-28, -29, and -30A are routinely monitored as part of ongoing operations for the ISB and MNA remedies; therefore, data gathering for the NPTF performance monitoring strategy will simply require integration and coordination of the monitoring frequency with the ISB and the MNA monitoring programs. If more frequent samples from these wells are needed for the evaluation, then additional samples will be added to the NPTF SAP.

2.1.1.2 Plume Capture Monitoring. The NPTF extraction/injection system was designed to capture 150% of the 1997 historical medial zone width. That design capture width is approximately 225 ft on either side of the longitudinal axis of the 1997 medial zone, as measured perpendicular to the ambient direction of groundwater flow (i.e., 225 ft north-northeast [NNE] and south-southwest [SSW] of the axis). Because TAN-40 is located very near the longitudinal axis of the plume, the 450-ft capture width (225 ft both NNE and SSW of the center line) can also be applied at TAN-40 in cases where TAN-40 is the only well being pumped.

Table 2-1. Operable Unit 1-07B groundwater remediation remedy monitoring crosswalk table.

Monitoring Zone	Monitoring Type	Sample Parameter	Decision/Evaluation Objective	Goal	Sample Program	Basis Document
Hot spot	ISB performance	ISB performance parameters: • VOCs • Tritium • Ethene, ethane, methane, redox, electron donor, bioactivity, and nutrient.	Trending: • Donor distribution • Source degradation • Flux • New donor	Optimize operation to meet compliance objectives/requirements.	ISB	ISB Work Plan
	ISB compliance	VOCs (TAN-28 and -30A)	VOCs below MCLs for 1 year	Achieve reduction of crossgradient flux to below MCLs.	ISB	ISB Work Plan
		VOCs (TAN-1860 and -1861)	VOCs below MCLs for 1 year	Achieve reduction of downgradient flux to below MCLs.		
	ISB completion compliance	All VOCs (wells TBD)	Hot spot completion	Determine ISB RAOs have been met in the hot spot.	ISB	ISB Remedial Action Report
	NPTF performance	VOCs plus radionuclides (strontium, cesium) (Wells TAN-28, -30A, and -29)	Upgradient source	NPTF contingency evaluation monitoring.	NPTF	NPTF Work Plan
	MNA performance	Radionuclides (strontium and cesium) (TAN-25, -37a and b, -28, -30A, -29, and TSF-05a and b)	Upgradient radionuclide monitoring (hot spot)	Monitor/evaluate hot spot radionuclide degradation and migration.	MNA	MNA Work Plan
Medial zone	NPTF performance	Drawdown	Facility operations	Plume capture	NPTF	NPTF Work Plan
	NPTF compliance	Facility influent/effluent VOCs and strontium	Facility operations	Stay within influent and effluent specifications.	NPTF	NPTF Work Plan
		Air emissions	Facility operations	Stay within effluent specifications.		
		Operations uptime	Facility operations	Maintain 90% uptime.		
		Extraction flow rate	Facility operations	Operate within specified flow rate.		
	NPTF completion compliance	All COCs (wells TBD)	Medial zone completion	Determine that NPTF RAOs have been or can be met in the medial zone.	NPTF	NPTF Work Plan

Table 2-1. (continued)

Monitoring Zone	Monitoring Type	Sample Parameter	Decision/Evaluation Objective	Goal	Sample Program	Basis Document
Distal zone	MNA performance	MNA performance parameters: • TCE • DCE • PCE • Vinyl chloride • Tritium	Breakthrough curves Plume expansion Degradation rate	Trends are toward achievement of RAOs.	MNA	MNA Work Plan
	MNA compliance	Annual for 5 years	MNA performance parameters	Annual sampling—a requirement for at least the first 5 years.	MNA	MNA Work Plan
	MNA completion compliance	All COCs	Remedial action completion	Determine that RAOs have been met throughout the plume.	MNA	MNA Remedial Action Report

COC = contaminant of concern
DCE = dichloroethene
ISB = in situ bioremediation
MCL = maximum contaminant level
MNA = monitored natural attenuation
NPTF = New Pump and Treat Facility
PCE = tetrachloroethene
PM/CM = performance/compliance monitoring
RAO = remedial action objective
TBD = to be determined
TCE = trichloroethene
VOC = volatile organic compound

Table 2-2. New Pump and Treat Facility performance monitoring/compliance monitoring criteria.

Monitoring Summary				
Remedy Phase	Performance Monitoring	Compliance Monitoring	Medial Zone Completion Criteria	Notes
Long-term operations Goal: To capture and treat groundwater from the medial zone for a sufficient period of time to restore the aquifer to COC concentrations less than MCLs, a hazard index less than 1, and cumulative carcinogenic risk less than 1×10^{-4} by 2095.	**Upgradient source control monitoring:** Evaluate ISB monitoring data, including data from TAN-29, to provide early warning of groundwater anomalies that may impact the performance of the NPTF.	**Facility operations:** Facility compliance will be monitored throughout the operating life of the NPTF and will include the following: Influent concentrations: Monitor water influent at SP-1. Air emissions: Shall remain below 0.18 lb/hr TCE. Air effluent will be monitored at SP-3 and SP-4. Effluent concentrations: VOC concentration shall remain below MCLs and a 1×10^{-5} total risk-based level. Water effluent will be sampled at SP-2. Operational Uptime: > 90% Extraction Flow Rate: 120–250 gpm. **Remedy compliance:** After the hot spot downgradient and crossgradient flux has been cut off and when all COC influent concentrations into the NPTF are below MCLs or have reached a long-term steady state condition, place the NPTF in standby and monitor all medial zone wells annually for 5 years (semi-annually for first year) to evaluate and determine if the RAOs can be achieved in the medial zone by 2095, without further operation of the NPTF.	Long-term operations will consist of a time period in which the NPTF reduces concentrations to RAOs, or until concentrations can be reduced to a level that will meet RAOs by using MNA by 2095.	Long-Term Operations began October 1, 2001. Facility operations reports will be submitted annually. NPTF operations will continue until TCE concentrations at TAN-33. TAN-36, and TAN-44 are less than 100µg/L. When this occurs, the NPTF will be placed in prolonged standby mode. Starting in March 2007, the NPTF will be restarted and drawdown measurements performed once concentrations reach 200 µg/L in either TAN-33, TAN-36, or TAN-40.

In order to identify antecedent trends and drawdown water levels at the observation wells, water levels will be measured (using electronic transducers and data loggers) prior to and after the startup of the NPTF extraction well pump. Based on preliminary testing, this data collection interval has proven useful for drawdown determinations. Drawdown tests performed every 6 months from October 2001 to March 2005 showed that the NPTF extraction well pumps consistently achieved the required drawdown necessary to obtain and maintain plume capture. Therefore, starting with the modified NPTF operations strategy in March 2007, drawdown measurements will be performed only during NPTF restart following prolonged standby status. (See Table 2-3 for a list of drawdown measurement wells and Figure 2-1 for well locations.) The frequency of drawdown measurements may be adjusted with agency concurrence.

2.1.2 Compliance Monitoring

The compliance monitoring strategy is divided into two components:

1. Facility operation compliance — to assure facility operation meets design specifications and ARAR

2. Remedy compliance — to gauge compliance with RAOs.

2.1.2.1 Facility Operation Compliance Monitoring. Facility operation compliance is conducted during facility operations to provide data with which to evaluate system performance relative to design specifications. This monitoring is conducted from facility startup to the end of long-term operations. It leads to periodic decisions regarding whether the facility is operating as expected and whether the remedy is trending toward meeting RAOs. These data also are reported periodically in routine operations reports. Once the monitoring data indicates that RAOs may have been achieved, the final component of the compliance monitoring strategy is implemented.

2.1.2.2 Remedy Compliance Monitoring. Remedy compliance is conducted once facility operations compliance monitoring data indicate that RAOs may have been achieved. This component of the compliance monitoring strategy is designed to provide data for agency review to determine that the remedy component has achieved RAOs within the medial zone.

Table 2-3. New Pump and Treat Facility drawdown measurement wells.

Well #	Direction	Comments
TAN-19	Transverse	—
TAN-32	Transverse	Capture zone achieved if drawdown is measured while pumping at TAN-40
TAN-33	Transverse	—
TAN-34	Transverse	—
TAN-36	Transverse	Capture zone achieved if drawdown is measured while pumping at TAN-38

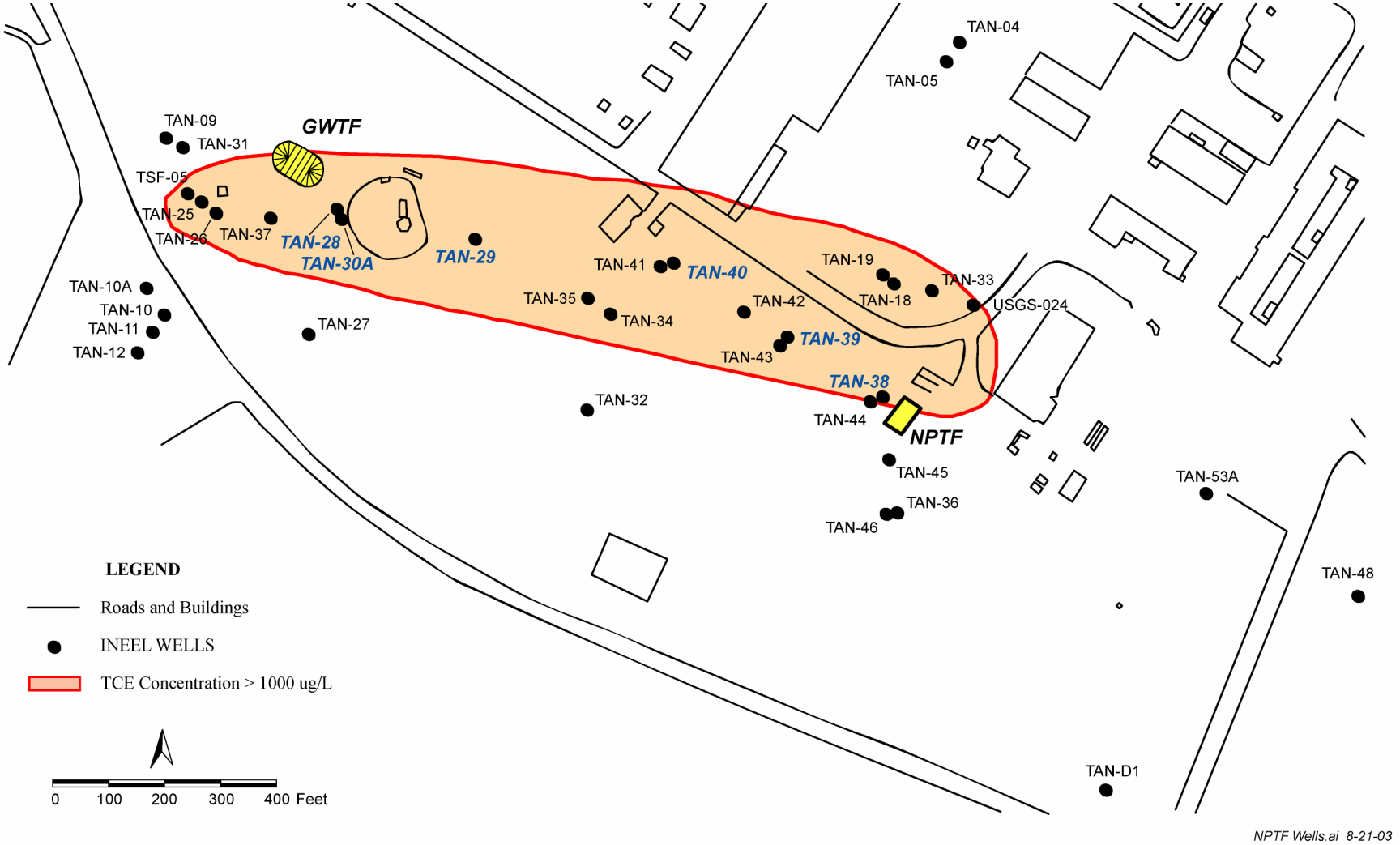

Figure 2-1. Well locations for drawdown measurements.

2.2 Remedy Performance Review and Closure

The OU 1-07B ROD (DOE-ID 1995) and the ROD Amendment (DOE-ID 2001a) require the Agencies to evaluate the effectiveness of the remedy in accordance with the standard CERCLA 5-year review process. Based on the evaluations performed during the 5-year reviews, the Agencies will decide to continue, modify, or discontinue the medial zone remedial action. The timing and approach for conducting 5-year reviews is addressed in the NPTF O&M Plan (DOE-ID 2007).

The planning and costing assumptions for the medial zone used in the 1995 ROD and the RD/RA SOW (DOE-ID 1995, 1997) assume an active remedial action time period of 30 years. Active remedial actions refer to remediation activities that involve other-than-natural processes (natural attenuation) and require O&M of a remedial action treatment system. The 5-year review process will ultimately provide for the completion of O&M activities with respect to the active remediation time period. At the completion of O&M activities, an O&M report will be prepared to support an agency decision that the active remedial action has been successful in supporting the RAOs for the medial zone. The O&M report also will specify any additional monitoring that will be performed under the MNA monitoring plan to ensure that the RAOs are maintained and/or achieved at the end of the 100-year remedial action time frame established in the ROD. The approach and requirements for the O&M report are addressed in the NPTF O&M Plan (DOE-ID 2007).

3. REGULATORY COMPLIANCE

The OU 1-07B 1995 ROD and the 2001 ROD Amendment identify the medial zone remedy as meeting the statutory requirements of Section 121 of CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and to the extent practicable, the NCP. These statutory requirements are met through the remedy being protective of human health and the environment and through remedy compliance with ARARs. Compliance with ARARs is addressed in the following sections.

3.1 Compliance with Applicable or Relevant and Appropriate Requirements

A detailed list of ARARs for the selected alternative is shown in Table 3-1. The table also identifies the documents that provide the specific ARAR implementation. The ARAR implementation strategy for the OU 1-07B Project is identified in Appendix A.

3.2 Environmental Compliance

The medial zone remediation activities comply with the substantive requirements of the National Environmental Policy Act (NEPA) through compliance with an environmental checklist specific to the NPTF operations. The environmental checklist provides the process review required to ensure compliance with environmental regulations.

3.3 Human Health and Safety

The medial zone remedial activities are performed in accordance with the requirements of the Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1910.120 and 1926.65, "Hazardous Waste Operations and Emergency Response." These requirements are implemented in accordance with the OU 1-07B HASP (INEEL 2005b).

3.4 U.S. Department of Energy Orders

There are numerous U.S. Department of Energy (DOE) directives in the form of orders, manuals, notices, and standards with which work performed at the Idaho National Laboratory (INL) must comply. These directives govern all aspects of work at INL and are typically implemented through Management Control Procedures, Technical Procedures, Plans, and other Site documents.

Table 3-1. Summary of applicable or relevant and appropriate requirements for remedial action.

Requirements	Citation[a]	ARAR Applicability by Location						
		RAWP	Remedial Design	O&M Plan	WMP	SAP	IDP	HASP
Clean Air Act and Idaho Air Regulations								
Idaho Air Pollutants, noncarcinogens	IDAPA 16.01.01.585	—	X	—	—	—	—	—
Idaho Air Pollutants, carcinogens	IDAPA 16.01.01.586	—	X	—	—	—	—	—
NESHAP – <10 mrem/yr	40 CFR 61.92	—	X	X	—	—	—	—
NESHAP – monitoring	40 CFR 61.93	—	X	X	—	—	—	—
ID Fugitive Dust	IDAPA 16.01.01.650 and .651	—	X	X	—	—	—	X
RCRA and HWMA								
Generator Standards	IDAPA 16.01.05.006							
Hazardous Waste Determination	40 CFR 262.11	—	—	—	X	—	—	—
General Facility Standards	IDAPA 16.01.05.008							
General Waste Analysis	40 CFR 264.13	—	—	—	X	—	—	—
Location Standards	40 CFR 264.18 (a) and (b)	X	X	X	—	—	—	—
Preparedness and Prevention	40 CFR 264.31–37	—	X	X	X	—	—	X
Closure Performance Standard	40 CFR 264.111	X	X	X	—	—	—	X
Disposal/Decontamination	40 CFR 264.114	X	X	X	—	—	—	X
Use/Management of Containers	40 CFR 264 Subpart I	—	X	X	X	—	—	—
Tank Systems	40 CFR 264 Subpart J	—	X	X	—	—	—	—
Land Disposal Restrictions	IDAPA 16.01.05.011	—	—	—	—	—	—	—
RCRA	Section 3020	—	X	—	—	—	—	—
Underground Injection Control								
Idaho Rules for the Construction and Use of Injection Wells	IDAPA 37.03.03	—	X	—	—	—	—	—

Table 3-1. (continued).

Requirements	Citation[a]	ARAR Applicability by Location						
		RAWP	Remedial Design	O&M Plan	WMP	SAP	IDP	HASP
ID Public Drinking Water								
MCLs (numerical standards only)	IDAPA 16.01.08.050.02 and .05	—	—	X	—	X	—	—
Secondary MCLs (numerical standards only)	IDAPA 16.01.08.400.03	—	—	X	—	—	—	—
National Historic Preservation Act								
Assessing Information needs	36 CFR 800.4(a)(1)(i),(iii)(a)(2)	X	X	X	—	—	—	—
Locating Historic Properties	36 CFR 800.4(b)	—	X	—	—	—	—	—
To Be Considered								
Radiation Protection of the Public and the Environment	DOE Order 5400.5	—	X	—	—	—	—	X

a. Citation of the Idaho Administrative Procedure Act incorporated by reference to the federal hazardous waste regulations as listed.

ARAR = applicable or relevant and appropriate requirement
CFR = Code of Federal Regulations
HASP = Health and Safety Plan
HWMA = Hazardous Waste Management Act
IDAPA = Idaho Administrative Procedures Act
IDP = Interim Decontamination Plan
MCL = maximum contaminant level
NESHAP = National Emissions Standards for Hazardous Air Pollutants
O&M = operations and maintenance
RAWP = Remedial Action Work Plan
RCRA = Resource Conservation and Recovery Act
SAP = Sampling and Analysis Plan
WMP = Waste Management Plan

4. REMEDIAL ACTION

This section addresses the procurement and construction of the NPTF, along with the administrative requirements for SO testing, prefinal inspection, initial operation, shakedown, and final inspection, which lead up to the NPTF being deemed operational and functional in the NPTF Remedial Action Report.

The activities discussed in this section were completed prior to Revision 1 of this document. Therefore, the text within this section has been revised to reflect how the activities were actually performed.

4.1 Facility Procurement and Construction

This section identifies the construction activities, project and construction management plans, procurement and subcontracting plans, quality assurance, and construction completion and inspection plans used to prepare the NPTF for the start of remedial activities. Figure 4-1 is a logic diagram that was used by the project to proceed from construction completion to preparing a remedial action report, and then finally to determine that the remedy was operational and functional. This section also identifies the general method of implementation of these activities. Particular attention is focused on unique or special techniques used to accomplish these activities.

4.1.1 Project Management and Construction Management

The *Environmental Regulatory Structure and Interface Protocol for CWI* (DOE-ID 2006b) and Management Control Procedure (MCP) -9109, "Preparation, Certification, and Transmittal of Environmental Deliverables," identify how the DOE-ID will interface with environmental regulatory agencies (e.g., DEQ and EPA) on issues covered by the cleanup of INL. The DOE-ID line management is responsible for oversight of environmental compliance at the INL with support from the DOE-ID Environmental Technical Support Division. For the Idaho Cleanup Project (ICP) contractor at the DOE Idaho Site, such compliance is the responsibility of line-management with support from the Environmental and Regulatory Services and the Environmental Restoration and Waste Area Group (WAG) 7 organizations.

The ICP contractor is obligated to manage and operate in full compliance with applicable laws, regulations, and agreements. In many cases, both the ICP contractor and DOE-ID are required to certify environmental documents that are submitted to regulators.

An organizational chart and position description is provided in the project HASP (INEEL 2005b).

4.1.2 Procurement and Subcontracting

The work involved in this remedial action is primarily focused on installing the facilities and ancillary components associated with the NPTF long-term operations. The NPTF construction was accomplished by subcontracting the work. A fixed-price contract was awarded to the lowest qualified bidder for the construction activities. The request for proposal specified (among other things) the period of performance, which corresponded with the overall project schedule.

4.1.3 Construction Activities

This section provides a task description of the facility construction activities, which include subcontract work, and site-worker accomplished work.

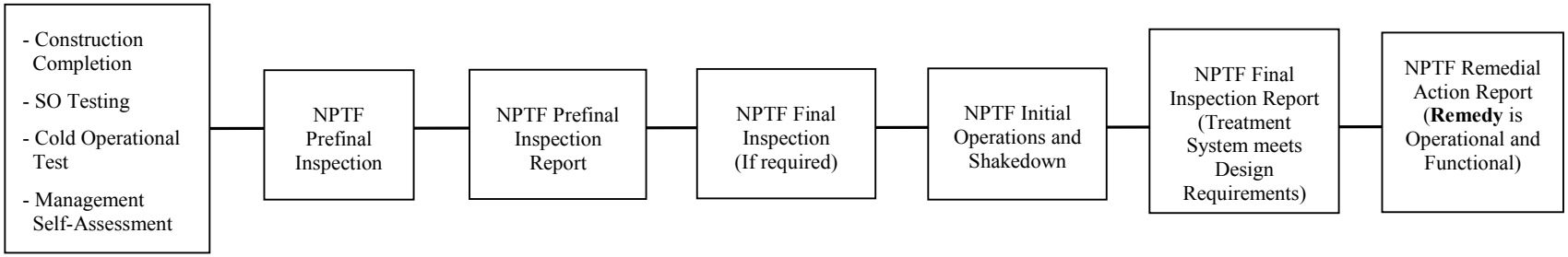

Figure 4-1. Agency remedial action acceptance logic diagram.

4.1.3.1 Premobilization. This time period was used to prepare the Subcontractor, site workers, and support personnel for the facility construction. This time frame included submittal, review, and approval of vendor data for near-term construction activities and long-lead items; submittal by the Subcontractor of work plans, bonds, and insurance certifications; as well as providing other documentation certifying compliance with training, medical, and quality requirements.

This period was used by the Contractor to perform a final assessment of their readiness to proceed with construction. These activities consisted of ensuring that the necessary permits had been acquired, personnel were available and trained, and that all the necessary Site and regulatory notifications had been made.

4.1.3.2 Mobilization. This time period was used by the Contractor and Subcontractor to prepare for construction activities. This work included the institution of required administrative and engineering controls including the following:

- Health and safety controls
- Fences, signs, and postings
- Identification and demarcation of the contamination and decontamination zones, lay-down, and staging areas
- Delivery and storage of construction materials and equipment
- Set-up of the Subcontractor's site offices.

4.1.3.3 New Pump and Treat Facility Construction. The construction of this facility was composed of three primary components: (1) extraction and reinjection components, (2) process system enclosure, and (3) process system. A description of the activities involved in the construction of these components follows below.

4.1.3.3.1 Extraction and Reinjection Components—The extraction and reinjection components consist of the influent and effluent piping and appurtenances, which extend from the extraction well heads to the process system, and from the process system to the reinjection well. This work included the following:

- Extraction Wells: Three extraction wells were constructed, and are used in support of this facility (Wells TAN-38, -39, and -40). These wells are completed as open-hole wells with no additional down-hole well completion planned for these wells.

  Each extraction well is equipped with an extraction pump and associated piping to bring the water to the surface and into the NPTF. During installation, the potential existed that this work would involve decontamination of equipment that came in contact with F001-listed groundwater. The OU 1-07B Interim Decontamination Plan (INEEL 2002) and the Waste Management Plan (WMP) (INEEL 2005a) were followed to handle any residue that was produced as a result of these activities.

- Reinjection Well: A reinjection well (TAN-53A) was installed downgradient from the extraction wells location. This well is located approximately 170 m (558 ft) southeast of the NPTF. This well was completed with casing to the water table approximately 64 m (210 ft) below land surface and as an open hole to the Q-R interbed. The reinjection well is equipped with an effluent line down-hole. See the remedial design for more information on this well and its location.

- Installation of power and control wiring from the process system to the well heads, and installation of valves and associated flow-control devices.

- Well Head Housing: Each extraction well is equipped with a well head housing enclosure. This structure is constructed of metal components, insulated and heated, and provided with electrical service. This structure is removable for ease of maintenance of the well and well-head components and appurtenances.

  This work included installation of a concrete foundation, including the requisite excavation, compaction, formwork, and finishing. The metal structure was constructed of lightweight metal structural components, wall and roof panels, and did not require extraordinary hoisting or construction techniques. The electrical service for the heating, lighting, and control features are powered and routed from the process facility building; they are considered minimal in nature.

- Extraction and Reinjection Influent and Effluent Piping: The piping manifold system for the extraction system involved construction of a large amount of double-walled piping in order to meet the 40 CFR 264, Subpart J secondary-containment requirements for tank systems processing hazardous waste. The reinjection piping does not require double-wall pipe.

  There were no extraordinary construction techniques involved in the construction of this piping. All process piping was installed above ground.

4.1.3.3.2 Process System Enclosure—The process system enclosure is the building that houses the water treatment system. The following work describes the foundation, building, heating, ventilation, and the building's electrical system:

- This work included installation of a concrete foundation and interior floor, including the requisite excavation, compaction, formwork, and finishing. The concrete floor within the enclosure provides secondary containment for the process equipment. Features include curbing, sloped floors, drain trench, and sump. Areas designated as a secondary containment were coated with an impermeable coating to prevent leaching of water and contaminants into the concrete floor.

- The building was a pre-engineered building constructed of structural steel, with metal walls and roof.

- Interior utilities include heating and ventilation, potable water, and electrical light fixtures and outlets. An electrical room was installed that provides the service panels for the building services, process system, and outlying well heads.

4.1.3.3.3 Process System—The process system consists of equipment, piping, pumps, tanks, and controls necessary to support operation of two parallel air stripper trains. Details regarding the system include the following:

- The process system materials and equipment are off-the-shelf items. The air stripper units were sized and specified per the specific requirements and concentration of VOCs present within the medial zone.

- The surge tank, air strippers, flow control valves and level indicators are all controlled within the electrical control room using the system control panel. A programmable logic controller is used to monitor system water levels and to adjust system flow rates as needed to maintain the required process limits.

4.1.3.4 Construction Completion and Closeout. Upon completion of the construction, the Subcontractor and Contractor performed a facility walkdown and developed a punch list to record deficient items. The walkdown also included a cold test of individual components to determine that they operated in accordance with the applicable specifications.

4.1.3.5 Demobilization. After the construction activities and inspections were satisfactorily completed and all equipment was operating properly, the Subcontractor demobilized from the construction site.

4.2 Startup and Operational Testing

After construction was complete, SO testing was performed on all systems components to ensure that the equipment was properly installed and operated in accordance with the design specifications. The SO testing was followed by a treatment system cold test to demonstrate proper operation of the total treatment system. The SO testing was performed in accordance with written startup and test procedures. For the operational cold test, all O&M procedures required for treatment system operations were complete. The required O&M procedures are identified in the NPTF O&M Plan (DOE-ID 2007).

Prior to the operational cold test, the project conducted a management self-assessment of the facility and of the facility's operational readiness. This included a review of procedures, training, and other items necessary to safely operate the system.

4.3 Prefinal Inspection Activities

The prefinal inspection report provides a means to document the prefinal inspection performed by the DOE-ID, EPA, and DEQ project managers or their designees, at completion of construction activities for long-term remedial actions, or at completion of remediation for short-term remedial actions.

4.3.1 Prefinal Inspection

The prefinal inspection of the NPTF was conducted by the agency project managers or their designees, prior to initial operations and shakedown of the treatment system. A prefinal inspection checklist was prepared prior to conducting the inspection and was agreed to by the Agencies prior to performing the inspection. An inspection was then conducted with all open items identified and recorded on the checklist. At the end of the inspection, the Agencies determined which open items required closure prior to the start of processing contaminated water.

4.3.2 Prefinal Inspection Report

A prefinal inspection report was prepared to document the results of the prefinal inspection. The report identified the open items from the inspection, the agreed-upon action for closing the open items, and the scheduled closure date for each open item. The prefinal inspection report was prepared as a secondary document for review by the Agencies. The prefinal inspection report included the following information:

- Completed prefinal inspection checklist
- Identification of open items
- Actions and schedule for closure of open items

- SO testing and operational cold test results
- Planned date for final inspection.

4.4 Final Inspection Activities

A final inspection was performed by the Agencies to review the closure of the open items documented during the prefinal inspection.

4.4.1 Final Inspection

The final inspection focused on closure verification of the prefinal inspection open items and satisfactory completion of the shakedown period.

4.4.2 Final Inspection Report

As defined in the RD/RA SOW (DOE-ID 1997), a final inspection report was prepared for the NPTF. The final inspection report addressed the following information:

- Results of the final inspection
- Evaluation of the effectiveness in meeting treatment system performance requirements based on the results of the shakedown period
- Resolution of outstanding items from the prefinal inspection report
- Explanation of any changes from the remedial design and RAWP
- O&M Plan update.

4.5 Initial Operations and Shakedown Period

Initial treatment system operations with contaminated groundwater began after satisfactory closure of prefinal inspection open items. The initial operations included a shakedown period to verify that the NPTF met system performance requirements. The operational shakedown period was used to carefully monitor system performance in order to ensure that the system (a) was operating in accordance with the approved specifications, (b) is operational and functional, and (c) is compliant with all applicable ARARs.

Further operational shakedown requirements are detailed in the NPTF O&M Plan (DOE-ID 2007).

4.6 Remedial Action Report

As specified in the RD/RA SOW (DOE-ID 1997), a remedial action report was prepared for the NPTF. The remedial action report is a primary document with a draft, draft final, and final submittals. The milestone date for this document is established in Section 11.

The remedial action report addressed the following information:

- Summary of remedial action components as defined in this RAWP
- Explanation of changes to the remedial design and RAWP
- Summary of the results from operational testing, the shakedown period, and the final inspections

- Evaluation of the effectiveness in meeting treatment system performance requirements
- Documentation of closure of any open items from the final inspection reports
- Summary of data collected during the remedial action that support a determination that the remedy is operational and functional
- Certification that the remedy is operational and functional
- Identification of needed changes to the O&M Plan.

5. OPERATIONS AND MAINTENANCE

The routine O&M activities and procedures for the medial zone remedial action component are covered in the NPTF O&M Plan (DOE-ID 2007). The NPTF O&M Plan identifies the approach and requirements for the O&M activities applicable to the medial zone portion of the OU 1-07B final remedial action. Additional remedy components for the hot spot and the distal zone of the plume will have separate RD/RA and operational documents. The scope of the O&M Plan includes NPTF O&M, groundwater monitoring, remedy 5-year reviews, and the final O&M report. The following are brief descriptions of the sections from the O&M Plan:

- Operations and Maintenance

  This section discusses and covers the routine O&M of the NPTF system. This includes identification and discussion of operating parameters, O&M procedures, inspection requirements, and waste management requirements. The operating parameters discussed are operational uptime requirements, upset conditions, and unplanned maintenance. The procedures that are outlined pertain to O&M of the NPTF treatment system. The inspection requirements discussed are those that are driven by regulations or considered good management practice.

- Remedy Compliance and Performance Monitoring

  This section discusses the implementation of the compliance and performance monitoring requirements. Compliance monitoring will be used to ensure the facility is operating in compliance with treated water effluent and air emission ARARs. Performance monitoring will be used to provide a periodic assessment of the treatment systems' ability to remediate the medial portion of the plume. Groundwater monitoring will be used to provide a periodic assessment of the overall plume remediation activities.

- Remedy Performance Review and Closure

  This section discusses and covers 5-year reviews and the O&M report. The 5-year review section identifies the methods and criteria for measuring performance of the remedy during the remediation time frame. The purpose of the O&M report will be to provide information that will support an agency decision that the active remedial action has been successful in supporting the medial zone RAOs.

- Institutional Controls

  This section discusses and covers planned administrative and engineering controls to protect current and future users from health risks associated with groundwater contamination.

- Decontamination and Decommissioning

  This section addresses the requirements for interim decontamination and final decontamination and decommissioning (D&D).

- Reports

  This section provides a summary of the reporting requirements applicable to the medial zone operations. Reports that are to be provided include:

  - National Emission Standards for hazardous air pollutants
  - Annual performance report
  - Five-year review reports
  - O&M report.

- Safety, Health, and Quality

  This section identifies where and how safety, health, and quality requirements are covered for NPTF operations.

6. DECONTAMINATION AND DECOMMISSIONING

Decontamination is a process whereby contaminants that have accumulated on or in equipment, tools, or treatment systems, are removed or neutralized such that they no longer present a hazard to human health or the environment. Decontamination efforts associated with OU 1-07B have been grouped into two activities: those that are involved with day-to-day operations, and those that are associated with the final shutdown and decommissioning of the NPTF.

6.1 Interim Decontamination

Detailed procedures for decontamination of equipment and other miscellaneous items may be found in the OU 1-07B Interim Decontamination Plan (INEEL 2002).

Decontamination of the tanks, containers, and equipment used for the remedial actions associated with OU 1-07B involves removal and disposal of wastes present in containers, and decontamination of the interiors of tanks, containers, and associated ancillary equipment that were in contact with waste, as necessary. Decontamination consists of rinsing the item to be decontaminated with water to meet the performance criteria in the OU 1-07B Interim Decontamination Plan. Spent decontamination water and other liquid waste streams generated during the decontamination process will be assessed for compatibility with the NPTF. Those streams that are compatible will be transferred to the NPTF for processing and disposal. Those waste streams that are not compatible with NPTF operations will be sampled and analyzed for characterization in accordance with the WMP (INEEL 2005a).

6.2 Final Decontamination and Decommissioning

Final D&D of the NPTF will be addressed after the Agencies determine that the active remediation is complete and/or that the treatment system is no longer required. The D&D requirements will be addressed in a future D&D plan. The D&D plan will direct that all tanks, containers, piping, and equipment will be flushed with clean water to remove as much contamination as possible. The system will then be dismantled and made ready for decontamination as directed by management. Components that can be decontaminated will be released for use in other systems or disposed of as industrial waste. The site will be returned to its preoperational condition to the extent feasible considering cost and intended future use.

The wells that are used in conjunction with the NPTF will continue to be used for monitoring the aquifer within the medial zone. If a well is no longer needed, it will be abandoned in accordance with INL and State of Idaho well-abandonment procedures.

The OU 1-07B CERCLA waste storage area will remain in place to accommodate project waste storage as needed. The project waste stored within the CERCLA waste storage area will be processed and disposed of as addressed in the WMP.

7. WASTE MANAGEMENT

All waste management activities will be conducted in accordance with the applicable substantive requirements specified in the project ARARs. The specific requirements for waste identification, characterization, segregation, packaging, labeling, storage, and inspection applicable to OU 1-07B are identified in the Waste Management Plan (INEEL 2005a).

Specific waste management regulatory issues that are applicable to OU 1-07B are summarized in the following sections.

7.1 Resource Conservation and Recovery Act Listed Waste

7.1.1 Listed Waste Determination

The TSF-05 injection well was drilled in 1953 to a depth of 93 m (310 ft) to dispose of liquid effluent generated from the Aircraft Nuclear Propulsion (ANP) project. Discharges to the well include organic sludges, treated sanitary sewage, process wastewater, and low-level radioactive waste streams. The principal VOC discharged was TCE. Estimates of the volume of TCE discharged to the well range from 1,325 to 97,161 L (350 to 25,670 gal). Previous evaluations of the solvents used at TAN concluded that the waste discharged to the injection well was not a RCRA-listed hazardous waste because the organic chemicals in the waste were not used as solvents or for degreasing, and because actual usage practices are not known (DOE-ID 1995).

In April 1997, based on new information, it was determined that a RCRA-listed solvent, TCE, was disposed of at the TAN Facility via the TSF-21 valve pit. Since the valve pit was connected to the TSF-05 injection well, the injection well and associated groundwater contamination plume are considered to contain RCRA-listed wastes. The RCRA-listed waste classification, waste code F001, is therefore applicable to the TCE-contaminated TAN groundwater and associated waste streams, and the substantive requirements of the ARARs are applicable for the RCRA-listed waste (INEEL 1997). The listed waste determination was implemented for OU 1-07B for waste that was not previously determined to be characteristic, based on an OU 1-07B Waste Management Compliance Commitments and Schedule dated July 22, 1997, which was concurred with by the Agencies per a DOE letter of August 29, 1997.[a]

7.1.2 No-Longer-Contained-In Determination

In accordance with 40 CFR 261.3, "Identification and Listing of Hazardous Waste," environmental media are considered to potentially contain RCRA-listed hazardous wastes, if there was a release to the media that included these wastes. Of the options available to manage wastes containing low to nondetectable concentrations of listed wastes, a no-longer-contained-in determination (NLCID) may be requested for these environmental media, soil, and groundwater. Until a NLCID is made for the OU 1-07B waste streams, that media will be managed as a listed hazardous CERCLA waste in accordance with the WMP (INEEL 2005a). In accordance with the ROD Amendment (DOE-ID 2001a), the NCLID is applicable to the waste stream once the air stripping process is complete, resulting in hazardous constituent concentrations less than MCLs and with a cumulative carcinogenic risk of less than 1×10^{-5}. The NLCIDs that have been approved are attached to the WMP.

a. Hain, K. E., DOE-ID, Manager of Environmental Restoration Program, to K. L. Falconer, INEEL, Director of Environmental Restoration, August 29, 1997, DOE-ID Letter OPE-ER-129-97.

7.2 Low-Level Radioactive Waste

Low-level radioactive waste will be generated during OU 1-07B activities. This waste is the result of radionuclide contamination in the TSF-05 injection well and is primarily associated with the sludge that is recovered from the TSF-05 well. This radioactive waste also normally contains RCRA F001-listed waste and, therefore, is classified as listed mixed waste.

8. EMERGENCY RESPONSE

Emergency response is covered by the *INEEL Emergency Action/RCRA Contingency Plan Addendum for TAN Facilities* (PLN-114), while the Emergency Action (EA) section of the OU 1-07B HASP (INEEL 2005b) contains primary emergency response actions for OU 1-07B site personnel, initial responses, task site responsibilities, emergency equipment at the task site, emergency response teams, and notification lists. This section of the HASP supplements the INL EA/RCRA contingency plan. Copies of both documents are kept in the OU 1-07B office. A copy of the HASP also will be kept in the NPTF control room.

The INEEL EA/RCRA contingency plan includes emergency response organizations and operational emergency event classes of fires, explosions, radiological releases, nonradiological releases, natural phenomena, loss of power, criticalities, safeguards and security, and external events. Sections 5 through 14 of the INEEL EA/RCRA contingency plan address notifications and communications, consequence assessment, protective actions, medical support, recovery and reentry, public information, emergency facilities, training (also covered in the OU 1-07B HASP), drills and exercises, and program administration. Appendix L4 of the INEEL EA/RCRA contingency plan contains the OU 1-07B Appendix "L." This appendix is specific to the OU 1-07B Project and defines specific measures and criteria used for OU 1-07B activities.

Emergency actions are primarily governed by the OU 1-07B HASP; however, when emergencies arise that are beyond the limitations of the HASP, the INEEL EA/RCRA contingency plan will be implemented. Therefore, in the event of an emergency, initial responders shall follow the direction of the HASP unless the resulting emergency is designated as a fire, explosion, or an uncontrolled release to the environment, in which case the INEEL EA/RCRA contingency plan will be implemented.

9. QUALITY ASSURANCE PROGRAM

The RAWP is intended to be used in conjunction with the *Quality Assurance Project Plan for WAGs 1, 2, 3, 4, 5, 6, 7, 10 and Removal Actions (QAPjP)* (DOE-ID 2006c).

The most important activities associated with the medial zone remedial action, with respect to quality assurance, are the data collection and analysis activities for compliance and performance monitoring. The quality assurance for these activities is described in detail in the NPTF O&M Plan (DOE-ID 2007) for compliance monitoring, and in the applicable sampling analysis plans for other groundwater monitoring activities throughout the project.

10. SAFETY AND HEALTH PROGRAM

The safety and health requirements for the medial zone remedial action activities include the areas of industrial safety, industrial hygiene, fire protection, radiation safety, and emergency preparedness. Safety and health requirements, in accordance with OSHA Standard 29 CFR 1910.120 and 1926.65, "Hazardous Waste Operations and Emergency Response," are designed and established to provide a safe and healthy work environment. Safety and health requirements are being implemented at the INL through the DOE Integrated Safety Management System (ISMS) and the Voluntary Protection Program (VPP). The ISMS and VPP provide for the integration of hazard identification and mitigation into the work control process for construction, operations, and maintenance activities.

Specific health and safety requirements, including hazard identification and mitigation, are addressed in the OU 1-07B HASP (INEEL 2005b).

11. COST AND SCHEDULE

This section addresses cost, schedule, and deliverables to Phase C remedy components and activities. Also included is a cost comparison of the current project baseline and the cost estimate in the OU 1-07B ROD. The current project baseline includes a refined cost estimate for NPTF construction based on the New Pump and Treat Facility Remedial Design (DOE-ID 2000).

11.1 Record of Decision Cost versus Current Baseline

Outyear funding availability for RD/RA projects is subject to congressional approval of DOE budgets. The DOE has identified adequate funding in existing budget plans for this project. Table 11-1 contains the project cost estimate from the OU 1-07B ROD and the Fiscal Year (FY) 1998 baseline estimate. This estimate and the assumptions contained in it may be used for comparison throughout the project. Depending on the outcome of the specified ROD and RD/RA SOW decision points, the actual remediation costs are expected to be within -30 to +50% of the ROD cost estimate.

Table 11-1. Operable Unit 1-07B cost summary.

Work Package	Description	ROD Cost Estimate[a] FY-95 $	Baseline Cost Estimate[a,b] FY-98 $
WP-2	Operation Transition from Phase A to Phase B	1,357	2,490
WP-3	Sludge Treatment/Disposal	92	10
WP-4	Pre-ROD Scoping	450	443
WP-5	Cleanup Technical Administrative Activities	1,862	9,597
WP-7	Hot Spot Containment/Removal	3,325	4,708
WP-8	NPTF Extraction Wells	212	1,300
WP-9	Phase C Remediation Operations	23,718	17,795
WP-10	Groundwater Monitoring	3,870	5,220
WP-11	Hydrology and Treatability Studies	4,828	11,010
WP-14	NPTF Design and Construction	—[c]	2,032
WP-15	Hot Spot Treatment	—[c]	3,180
WP-16	Distal Zone Treatment	—[c]	2,420
	Contingency	7,902	—
	TOTAL	47,616	60,205

a. Dollars are in the thousands.
b. The baseline cost estimate includes actual cost through FY 98 and baseline estimated cost for FY 1999 through FY 2006.
c. In the ROD, these costs were included under the line item for WP-9, Phase C Remediation Operations.

FY = fiscal year
NPTF = New Pump and Treat Facility
ROD = Record of Decision

11.2 New Pump and Treat Facility Construction Estimate

Table 11-2 provides a divisional breakdown of the estimated NPTF construction costs. This estimate is based upon the NPTF 90% design. The estimate covers the cost of constructing the facility and connecting to existing utilities. Operations and D&D costs for the NPTF are covered in the overall project baseline cost identified in the previous section.

Table 11-2. New Pump and Treat Facility 90% construction cost estimate.

	Cost ($)	
Operation	Subtotal	Total
Site Work		55,975
Concrete		89,693
Building/Enclosure		160,319
Structure	87,306	
HVAC	27,090	
Well Head Enclosures	45,923	
Process System		612,104
Equipment	117,844	
Instrumentation and Control	142,500	
Internal Piping	70,911	
Influent Piping	136,819	
Effluent Piping	64,385	
Well Pumps	79,645	
Utilities		104,569
Subtotal Direct Construction Cost[a]		1,022,660
Contingency (20%)		161,507
Reinjection Well and Monitoring Well		250,000
Construction/Project Management		174,728
TOTAL		1,608,895

a. Direct construction costs do not include O&M contractor adders.
HVAC = heating, ventilating, and air conditioning

11.3 Schedule

The documents submitted to the EPA and Idaho Department of Health and Welfare (IDHW) as deliverables are presented in Table 11-3 with their corresponding submittal dates in accordance with Section XII of the Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991). Milestone deliverable dates presented in Table 11-3 were established in the RD/RA SOW (DOE-ID 1997), and, where applicable, are presented as modified by subsequent agency agreement. This table and the subsequent schedule (see Figure 11-1) only include deliverables up through the initiation of the remedial action.

Table 11-3. Operable Unit 1-07B deliverables log.

Deliverables	Submittal Planned Date	Submittal Enforceable Date	Review Length (days)	Document Type
Treatability Studies				
Phase I FDR (Draft)	01/26/00	01/31/00	45	Primary
Medial Zone Groundwater Treatment				
Draft NPTF Functional and Operational Requirements	12/05/97	N/A	45	Disputable
NPTF (30%) Design	09/29/98	N/A	30	Secondary
Draft RD/RAWP-NPTF	04/02/99	04/30/99	45	Primary
NPTF RA Report	08/02/01	11/02/01	45	Primary
NPTF Annual Performance Report	3 months after end of reporting period	N/A	N/A	Information
NPTF Operations and Maintenance Report	TBD[a]	TBD[a]	45	Primary

a. Deliverable dates will be established based on the evaluations during the 5-year reviews.

FDR = field demonstration report
NPTF = New Pump and Treat Facility
RA = remedial action
RAWP = Remedial Action Work Plan
TBD = to be determined

Documents will have expedited and nonexpedited review and revision schedules. The review periods vary depending on the document. In general, all expedited draft primary documents have a 30-day review, and in some instances the draft final submittal has been eliminated. Draft primary documents (nonexpedited) have the standard 45-day review period. Secondary documents will have their standard 30-day review period. The DOE review will be concurrent with the EPA and IDHW review. (Document review comments and resolutions from Agencies reviews of drafts of this plan are provided in Appendix B.)

Figure 11-1 is the schedule of activities for NPTF construction up through initiation of operations.

Activity Description	Duration	Early Start	Early Finish
OU 1-07B TAN Final GW Remediation NPTF RD/RA	574 *	30/11/98	15/02/01
NPTF 90% Design	104 *	30/11/98 A	26/04/99 A
Start OU 1-07B NPTF RD/RA Schedule	0	30/11/98 A	30/11/98 A
Prepare 90% Design	100	30/11/98 A	26/04/99 A
NPTF RD/RA Work Plan	197 *	30/11/98 A	02/09/99 A
Prepare RD/RA Work Plan	100	30/11/98 A	26/04/99 A
OU 1-07B Draft RD/RA Work Plan Submitted to Agen	0	26/04/99 A	26/04/99 A
Draft RD/RA Work Plan Agency Review	33	27/04/99 A	11/06/99 A
Draft RD/RA Work Plan Comment Resolution/Revisio	35	14/06/99 A	30/07/99 A
OU 1-07B Draft Final RD/RA Work Plan Submitted t	0	30/07/99 A	30/07/99 A
Draft Final RD/RA Work Plan Agency Review	11	02/08/99 A	16/08/99 A
Final RD/RA Work Plan Comment Resolution	13	17/08/99 A	02/09/99 A
OU 1-07B RD/RA Work Plan Becomes Final	0	02/09/99 A	02/09/99 A
NPTF Procure/Construct/Test	357 *	01/10/99 A	15/02/01 A
Procurement Specification/RFP Package	42	01/10/99 A	01/12/99 A
Bid Preparation, Evaluation & Award	39	02/12/99 A	01/02/00 A
Premobilization & Mobilzation	31	02/02/00 A	15/03/00 A
Facility Construction	181	16/03/00 A	31/10/00 A
Prepare O&M Procedures	119	16/03/00 A	31/05/00 A
O&M Manual Preparations	22	02/08/00 A	31/08/00 A
O&M Plan Revisions	22	02/08/00 A	31/08/00 A
Project Review O&M Plan	10	01/09/00 A	15/09/00 A
Project Review O&M Plan Comment Resolution	10	18/09/00 A	29/09/00 A
IRC Review O&M Plan	10	02/10/00 A	13/10/00 A
IRC Review O&M Plan Comment Resolution	10	16/10/00 A	27/10/00 A
OU 1-07B Draft O&M Plan Submitted to the Agencie	0	27/10/00 A	27/10/00 A
Agency Review O&M Plan	22	30/10/00 A	30/11/00 A
OU 1-07B NPTF Construction Complete	0	31/10/00 A	31/10/00 A
Startup and Operational Testing	10	01/11/00 A	14/11/00 A
Management Self Assessment (MSA)	10	15/11/00 A	30/11/00 A
Pre-Final Inspection	10	01/12/00 A	14/12/00 A
Pre-Final Inspection Report Preparation	39	15/12/00 A	15/02/01 A
Agency Comment Resolution and Finalize O&M Plan	15	15/12/00 A	12/01/01 A
OU 1-07B NPTF Pre-Final Inspection Report to Age	0	15/02/01 A	15/02/01 A
NPTF Operations	0 *	03/01/00	03/01/00
Shakedown Operations	53	15/01/01 A	28/03/01 A
Final Inspection	11	01/03/01 A	15/03/01 A
Prepare Final Inspection Report	32	16/03/01 A	30/04/01 A
Routine Operations	4000	29/03/01 A	30/09/25 A
OU 1-07B Final Inspection Report to Agencies	0	30/04/01 A	30/04/01 A
End OU 1-07B NPTF RD/RA Schedule	0	30/09/25 A	30/09/25 A

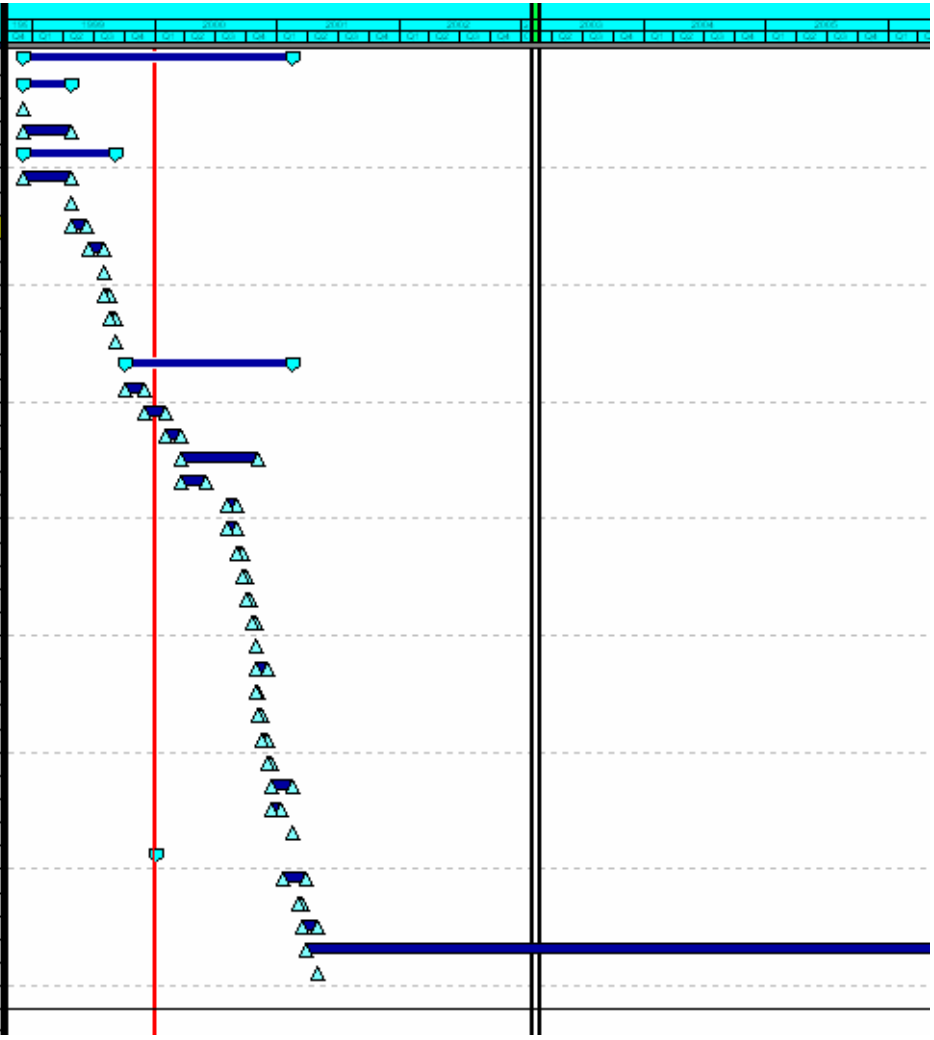

Figure 11-1. New Pump and Treat Facility construction schedule.

12. REFERENCES

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Appendix A

Compliance with Regulatory Requirements

Appendix A

Compliance with Regulatory Requirements

Table A-1. Compliance with regulatory requirements.

Category	Type	Regulatory Requirements	Implementation Strategy
Air Discharges (Carcinogens and Noncarcinogens)	Chemical	Idaho Toxic Air Pollutants For all sources constructed or modified since May 1, 1994, the net screening emissions levels (EL) and net acceptable ambient concentrations (AAC) for non-carcinogens which are not specifically controlled elsewhere in Idaho Administrative Procedures Act (IDAPA) regulation will comply with the table identified in IDAPA 58.01.01.585. For all sources constructed or modified since May 1, 1994, the net screening ELs and AAC for carcinogens which are not specifically controlled elsewhere in these rules, are as provided in the table identified in IDAPA 58.01.01.586. IDAPA 58.01.01.585 and IDAPA 58.01.01.586.	This requirement is only applicable for the medial zone remedy. The NPTF air emissions were modeled using an EPA-approved air modeling program. Air emissions limits were established using the model results. The results of this modeling are documented in the NPTF Remedial Design (DOE-ID 2000).
Air Discharges (Radionuclide)	Chemical	National Emissions Standards for Hazardous Air Pollutants (NESHAP) Emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/year. 40 CFR 61.92 Establishes standards and requirements for operations of the DOE and DOE contractors with respect to protection of members of the public and the environment against undue risk from radiation. Includes narrative and numerical standards (air and water) for management of radioactive liquid effluent and radiation protection of the public. In addition, the Order provides radiological protection requirements and guidelines for cleanup of residual radioactive material and management of the resulting wastes and residues, and release of property. DOE Order 5400.5 (To Be Considered)	This requirement is only applicable for the medial zone remedy. Emissions from the NPTF will be estimated using calculations as allowed under the provisions of 40 CFR 61.93. The calculated emissions will be given to INL Environmental Affairs personnel for inclusion in the annual INL NESHAP Report.

Table A-1. (continued).

Category	Type	Regulatory Requirements	Implementation Strategy
Air Discharges (Monitoring)	Action	Continuously monitor radionuclide emissions per the requirements in 40 CFR 61.93, if the discharge of radionuclides without pollution control equipment could cause an effective dose equivalent in excess of 0.1 mrem/yr. If continuous emissions modeling is not required, periodically perform confirmatory measurements to verify the low emissions. 40 CFR 61.93	This requirement is only applicable to the medial zone remedy. Annual radionuclide emissions from the NPTF will be conservatively calculated using the following parameters: • Overall quantity of waste processed • Average radionuclide concentration (i.e., tritium) • Air stream flow rate. The emissions will then be included in a Site-wide model to determine the effective dose equivalent for the nearest public receptor. If predicted uncontrolled emissions are less than 0.1 mrem/yr, then uncontrolled emissions will be periodically estimated and documented as outlined in the NPTF O&M Plan (DOE-ID 2007).
Fugitive Dust	Action	All reasonable precautions will be taken to prevent the generation of fugitive dust. IDAPA 58.01.01.651 identifies examples of reasonable precautions for preventing fugitive dust. IDAPA 58.01.01.650 and .651	During construction activities, all reasonable precautions will be taken to minimize fugitive dust through application of engineering controls. Potential options include: • Use of water sprays and dust suppressants • Halting construction activities during periods of high winds.
Hazardous Waste Determination	Action	A person who generates a solid waste must determine if the waste is a hazardous waste by using the following method: 1. Determine if the waste is excluded under (40 CFR 261.4) 2. Determine if the waste is listed as a hazardous waste in 40 CFR 261, subpart D 3. For the purposes of compliance with 40 CFR part 268, or if the waste is not listed in subpart D of 40 CFR part 261, the generator must then determine whether the waste is identified in subpart C (characteristic) of 40 CFR part 261. IDAPA 58.01.05.006 (40 CFR 262.11)	Any waste streams generated during the remediation process for storage and/or disposal will have a hazardous waste determination performed. If needed, sampling will be conducted in accordance with a task-specific sampling and analysis plan. All generated waste will be packaged, handled, and stored in accordance with the Waste Management Plan (INEEL 2005). Waste minimization activities will be implemented in accordance with the INL Waste Acceptance Criteria (DOE-ID 2005). Trained personnel will inspect and ensure the CERCLA waste storage units are in compliance with all applicable regulations.

Table A-1. (continued).

Category	Type	Regulatory Requirements	Implementation Strategy
General Waste Analysis	Action	General facility standards require that operators of a facility must obtain chemical and physical analyses of a representative sample of each hazardous waste to be treated, stored, or disposed of at the facility prior to treatment, storage, or disposal. The analysis may include existing published or documented data on the hazardous waste or on hazardous waste generated from a similar process. At a minimum, the analysis must contain all the information which must be known to treat, store, or dispose of the waste in accordance with this part and part 268 of this chapter. IDAPA 58.01.05.008 (40 CFR 264.13)	Waste stream management requirements are based on a waste evaluation supported by a project sampling and analysis plan and/or process knowledge. This information will provide the basis for determining: container requirements, storage requirements, labeling requirements, and treatment and disposal requirements. All waste (both radionuclide and VOC) generated during remediation operations will be managed through facility procedures in accordance with the Waste Management Plan (INEEL 2005).
General Facility Standards (Site Selection)	Location	Seismic considerations for portions of new facilities where treatment, storage, or disposal of hazardous waste will be conducted must not be located within 61 meters (200 feet) of a fault which has had displacement in Holocene time. A facility located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout or any hazardous waste by a 100-year flood, unless the owner or operator can demonstrate to the Regional Administrator's satisfaction that: (i) Procedures are in effect which will cause the waste to be removed safely, before flood waters can reach the facility, to a location where the wastes will not be vulnerable to flood waters; or (ii) For existing surface impoundments, waste piles, land treatment units, landfills, and miscellaneous units, no adverse effects on human health or the environment will result if washout occurs. IDAPA 58.01.05.008 (40 CFR 264.18(a) and (b))	Construction activities involving siting a facility will take into consideration: • Site hydrology, geology, and waste characteristics; • Compliance with the NEPA process; • Potential sites must be evaluated for natural hazards such as floods, erosion, tornadoes, earthquakes, and volcanoes; • Areas subject to surface geological processes (i.e., mass wasting, erosion, slumping, landslides, and weathering) which significantly affect the ability of the disposal facility to meet the performance objectives will be avoided. Current area designations show that the OU 1-07B Project Area is not within a 100-year floodplain.
General Facility Standards (Preparedness and Prevention)	Action	Treatment, Storage, and Disposal (TSD) operators must design, construct, maintain and operate facilities to minimize the possibility of fire, explosion or any unplanned sudden or non-sudden release of hazardous waste to air, soil, or surface water which might threaten human health or the environment. IDAPA 58.01.05.008 (40 CFR 264.31 through .35 and .37)	New and existing facilities will continue to be designed, inspected and operated in compliance with Site procedures and the requirements of this section. New treatment systems and any modifications to existing facilities as well as current operations will consider the design and operational requirements of these sections when developing the design requirements.

Table A-1. (continued).

Category	Type	Regulatory Requirements	Implementation Strategy
Closure Performance Standards	Action	The owner or operator must close the facility in a manner that: 1. Minimizes the need for further maintenance, 2. Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere, and 3. Complies with the closure requirements of this subpart. IDAPA 58.01.05.008 (40 CFR 264.111) During the partial and final closure periods, all contaminated equipment, structures and soils must be properly disposed of or decontaminated unless otherwise specified in Sections 264.197, 264.228, 264.258, 264.280 or Section 264.310. By removing any hazardous wastes or hazardous constituents during partial and final closure, the owner or operator may become a generator of hazardous waste and must handle that waste in accordance with all applicable requirements of part 262 of this chapter. IDAPA 58.01.05.008 (40 CFR 264.114)	Once remediation activities have achieved compliance with remediation goals, closeout procedures will be implemented. An evaluation of the equipment and storage areas will determine closure requirements and management of the materials, pump and treat equipment, and associated ancillary piping. Emphasis will be placed on minimal site O&M at completion of closure. All equipment, materials, and associated debris generated during project closeout will be adequately characterized to determine waste management requirements.

Table A-1. (continued).

Category	Type	Regulatory Requirements	Implementation Strategy
Container Management	Action	1. Remediation wastes will be kept in containers meeting the requirements of 40 CFR 264.171; 2. Wastes will be stored with compatible containers; 3. Containers will be properly managed; and 4. The storage facility will be subject to inspections under 40 CFR 264.174. 5. The storage area containment system will be in accordance with 40 CFR 264.175. IDAPA 58.01.05.008 (40 CFR 264 subpart I)	Characterization results via process knowledge or analytical results will dictate the packaging requirements, determine storage requirements, and determine compatibility with other wastes. Waste containers will be properly labeled and managed in accordance with existing operating procedures. All containerized waste will be subject to RCRA storage facility inspection requirements. If required, the storage containers will be stored within the CERCLA Waste Storage Area. Containers used to transport water extracted during groundwater sampling will not be double-walled containers. If water is stored in these containers (>3 days), they will be placed in a container storage area with secondary containment. Any new treatment systems and any future facility modifications will be designed to provide adequate containment. These requirements will be covered and implemented through the Waste Management Plan (INEEL 2005) and respective Phase C Remedial Designs.
Tank Systems	Action	The tank system utilized in processing the remediation waste streams generated during remediation operations will comply with the tank system requirements under 40 CFR 264 subpart J which includes: 1. Assessment of the tank's system integrity; 2. Containment and detection of releases; 3. General operating requirements; 4. Inspections; 5. Response to leaks or spills; and 6. Closure and Post-Closure care. IDAPA 58.01.05.008 (40 CFR 264 subpart J)	The tank systems will be inspected once per operating day. The inspection will check for visible leakage and signs of corrosion, and will check the leak detection system for indications of leakage. Any new treatment systems and any future facility modifications will be designed to address the need for adequate containment and regulatory requirements. Any new tanks used in new remediation facilities that are designated as a tank system will be certified by an independent qualified registered professional engineer attesting that the tank system has sufficient structural integrity and is acceptable for storing and treating hazardous waste.

Table A-1. (continued).

Category	Type	Regulatory Requirements	Implementation Strategy
Land Disposal Restrictions	Action	IDAPA Regulation 58.01.05.011 identifies that all of 40 CFR Part 268 and all subparts are herein incorporated by reference as provided in 40 CFR, revised as of July 1, 1994, except for 40 CFR Parts 268.5, 268.6, 268.42(b) and 268.44. Except as specifically provided otherwise in this part or part 261 of this chapter, the requirements of this part apply to persons who generate or transport hazardous waste and owners and operators of hazardous waste treatment, storage, and disposal facilities. Restricted wastes may continue to be land disposed as follows: 1. Where persons have been granted an extension to the effective date of a prohibition under subpart C of this part or pursuant to Section 268.5, with respect to those wastes covered by the extension; 2. Where persons have been granted an exemption from a prohibition pursuant to a petition under Section 268.6, with respect to those wastes and units covered by the petition; 3. Wastes that are hazardous only because they exhibit a hazardous characteristic, and which are otherwise prohibited from land disposal under this part, are not prohibited from land disposal if the wastes: a. Are disposed into a nonhazardous or hazardous injection well as defined in 40 CFR 144.6(a); and b. Do not exhibit any prohibited characteristic of hazardous waste at the point of injection; and c. If at the point of generation the injected wastes include D001 High TOC subcategory wastes or D012-D017 pesticide wastes that are prohibited under Section 148.17(c) of this chapter, those wastes have been treated to meet the treatment standards of Section 268.40 before injection. IDAPA 58.01.05.011	Wastes generated as a result of remediation efforts will be characterized for determining management requirements. Additionally, each waste stream will be evaluated to determine the applicability of land disposal restrictions (LDRs). Waste streams subject to LDRs will be segregated and consolidated with compatible waste streams, as appropriate, when similar treatment technologies can be utilized. Waste streams generated from implementation of treatment technologies will be captured and appropriately managed based on classification.

Table A-1. (continued).

Category	Type	Regulatory Requirements	Implementation Strategy
Water Quality	Action	Contaminated groundwater may not be injected back into the aquifer in which it came unless the groundwater is treated to substantially reduce hazard constituents prior to such reinjection. Section 3020 of RCRA.	Any extracted groundwater obtained during performance of the OU 1-07B remedial activities will be processed through the NPTF prior to reinjection. Processing through the NPTF will substantially reduce the hazardous constituents.
Water Quality (Underground Injection Control)	Action	No chemical contaminants at concentrations above MCLs, or above the contaminant concentration of the receiving water can be injected into the aquifer. No radionuclides above MCLs, or hazardous waste, can be injected into the aquifer. IDAPA 37.03.03	The design of the NPTF has incorporated the substantive requirements specified within this IDAPA regulation.
Water Quality (Monitoring)	Action	Monitoring, record keeping and reporting may be required if the well could adversely affect a drinking water source or if injecting a contaminant that could have an unacceptable effect upon the quality of the groundwaters of the state. The state may require where appropriate, but is not limited to, the following: 1. Any injection authorized by the state shall be subject to monitoring and record keeping requirements as conditions of the permit; 2. The frequency of required monitoring shall be specified in the permit; 3. All monitoring tests and analysis required by permit conditions shall be performed in a state-certified laboratory or other laboratory approved by the state; 4. Any field instrumentation used to gather data, when specified as a condition of the permit, shall be tested and maintained in such a manner as to ensure the accuracy of the data; and 5. All samples and measurements taken for the purpose of monitoring shall be representative of the monitoring activity and fluids injected. IDAPA 37.03.03.055.01	Any systems or components that inject materials into the aquifer during the remedial activities will meet these requirements as established in the individual work plans. Periodic monitoring will be performed to show compliance with this regulation.

Table A-1. (continued).

Category	Type	Regulatory Requirements	Implementation Strategy
Drinking Water Standards (MCLs)	Chemical	The following are the MCLs per Federal and State drinking water standards, in effect on the date of the original ROD signature. Organics — MCL (µg/L) PCE — 5 TCE — 5 cis-DCE — 70 trans-DCE — 100 The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 mrem/year. Radionuclides — MCL (pCi/L) Cesium-137 — 119 Tritium — 20,000 Strontium-90 — 8 Uranium-234 — 30 pCi (proposed) IDAPA 58.01.08.050.02 and .05 (40 CFR 141.12 and .16) The State of Idaho Secondary Drinking Water Standards (IDAPA 58.01.08.400.03) are a Chemical-Specific ARAR. These standards establish primary and secondary MCLs. Secondary MCLs are a consideration for in situ bioremediation because the implementation will involve the injection of treatment agents (i.e., nutrients). These treatment agents may initially exceed the established secondary MCLs. IDAPA 58.01.08.400.03	If any new radionuclides are identified without existing MCLs, calculations will be performed to estimate radionuclide uptake. Then a back calculation to determine maximum radionuclide activities will be performed, and annual maximum inputs determined. Groundwater monitoring will be performed to collect data to monitor the progress of cleaning the contaminated plume to concentrations below MCLs. Secondary MCLs were developed as aesthetic guidelines for the public acceptance of drinking water and are not federally enforceable. These secondary groundwater quality standards must be achieved at the completion of the restoration time frame, which is specified as year 2095. Therefore, although concentrations of manganese or other treatment agents in or near the hot spot or reactive zone may exceed the secondary MCLs as a result of implementing the hot spot remedy, this excursion is acceptable because the hot spot and medial zones are not currently drinking water sources. In situ bioremediation is being implemented to remove TCE in an attempt to restore the aquifer to drinking water quality within the 2095 time frame. Therefore, it is not appropriate to apply secondary MCLs before the end of the restoration period. Institutional controls are part of the remedial action and will be protective of human health and the environment during the restoration time frame.
Historic Preservation	Location	The Secretary of the Interior must be notified in writing whenever DOE finds or is notified in writing by an appropriate historical or archaeological authority that the activities in connection with a project may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archaeological data. The DOE or the Department of Interior must preserve any data that may be lost or destroyed. 36 CFR 800.4(a)(1)(i),(iii)(a)(2) 36 CFR 800.4(b)	All areas within the hot spot and medial zone have been surveyed and evaluated for historical preservation resources. Any siting of new facilities or wells will be surveyed and evaluated to determine if there will be any impacts to historical sites.

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Appendix B

Agencies Phase C Document Review Comments and Resolutions

Appendix B-1

Document Review Comments and Resolutions
September 16, 1999

PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: New Pump and Treat Facility 90 Percent Design, Draft Phase C Remedial Action Work Plan, and supporting documents for Test Area North Groundwater Remediation

DATE: September 16, 1999 **REVIEWER:** EPA

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
General Comments				
1			Responses to comments on the draft 90% NPTF design documents were reviewed. Based on this review, the following responses are not sufficient, and additional clarification is needed.	No resolution necessary.
2			General Comment 2: The final sentence of this response states that this system can be upgraded (i.e., add more trays to the air strippers) if needed to improve efficiency. Text should be added, possibly in the NPTF design document, stating how many trays can be added, and the expected efficiency of these additions, both in terms of handling additional flow (assume design concentrations remain constant), and also in terms of handling increased concentrations (assume influent of 250 GPM remains constant). This additional text would demonstrate the robustness of this system.	Text will be added that states that the air stripper will be upgradeable and that space will be provided to accommodate future upgrades. The actual efficiency increase due to a single tray or change in flowrate will be dependent on the actual vendor selected.
3			General Comment 5: This comment discussed potential iron and manganese fouling. Although the response to this comment stated that this kind of fouling is not expected, the buildup of mineral scale, which is typical in hard-water environment such as in this aquifer, can be reasonably expected over a 30 year time-frame of operations. The text should state how this common type of buildup will be addressed, including items such as disposal of cleaning wastes.	A procedure will be developed and included as part of the NPTF Phase C O&M Manual which details an inspection schedule and cleaning methods for this equipment. Text will be added to the 90% design indicating this.
4			General Comment 7: The response to this comment states that the system will not start up in the recirculation configuration, although samples will be collected daily to ensure that MCLs are not exceeded in the discharge. If the first daily sample exceeds MCLs, will the system default to recirculation, or some alternative plan, immediately? What is the expected analytical turnaround time to minimize inadvertent disposal of samples greater than MCLs?	Operations and sampling will be done as stated in the text. There is a possibility that MCLs will be exceeded, however, a decision to stop operation will be made on a case by case basis depending on the level of exceedence. A high exceedence level is not expected.
5			Comments 10, 21b, 21c. General responses to these comments state "it [the discharge line size] was selected based on pump	The pump was selected based on flowrate and head calculated for the effluent pipe system using a 2" effluent line. The pump

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ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
			selection ...", and similar statements. Were the pumps selected in advance of the NPTF design? Pumps with 2" outlets are available. In particular, the response to 21c implies that reduction across the pump (inlet versus outlet) is the mechanism which produces the head needed to pump fluid. This explanation of pump dynamics is without a scientific or engineering basis. Also, any head generated as a result of this reduction would be lost immediately with the enlargement to 2" directly after the pump outlet. We reiterate that a pump with a larger diameter outlet is needed to better support this design by preventing possible stresses to this system.	that meets the requirements has a 1-1/2" discharge. This is typical of the selected type of pumps. The pump specified is not being sole sourced as the design specification indicate an "or equal" clause. The 90% design equipment list will be modified to include the "or equal" designation.
6			** Comment 15e. The Crane model results were reviewed. However, these results cannot be interpreted without a manual or a description of the calculations being performed. We still believe that the "T" connection, shown in Figure P-2 of the draft final NPTF document, which blends the two effluent streams from the air strippers, is unacceptable from a hydraulic design standpoint. The Crane modeling is idealized, because it assumes that each flow stream entering the "T" will be equal in flowrate. This will not be true, as referenced in the text at Section 2.5, Page 2-3, which describes that one air stripper influent stream will be held fixed while the other influent stream will vary automatically to maintain a constant water level in the surge tank. Hence, this "T" will be subjected to variable forces. The response to this comment is unacceptable, and this response should include documentation that the momentum forces at the "T" will be dissipated, as currently designed. Otherwise, the variable forces on this "T" may cause leaks over time. (RB)	No change; the issue was discussed during a conference call and it was agreed no change was necessary.
7			** Comment 17 states that air stripper influent air will pass through a filter/bug screen to prevent air stripper fouling. This filter/screen is not apparent in any of the drawings and should be included.	Filter will be added to drawing.

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ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
8			Comment 18b: This comment originally recommended a low water level sensor on the surge tank, to prevent the air stripper feed pumps from running dry. Per the draft final 90% NPTF design and the comment response, this level sensor is not added. Instead the response states that the system will eventually shut down automatically if a low water condition continues. No mechanism for this automatic shutdown is apparent; please provide more detail. Further, Drawing P-1 in the NPTF 90% draft final design still shows a "LSL" ("Level Switch Low") on this surge tank. Clarify the discrepancy between this response and the apparent inclusion of a low water sensor in this drawing.	Comment 18b suggested that a low water level be added to the list of items that initiate a system shutdown. The level sensor is included in the design. It is based on current water level (using the level transmitter) and controlled by the PLC. A low water condition will turn off the discharge pump. It will not initiate a complete system shutdown. This will allow the system to continue processing the water within the air stripper. After which, the system will shutdown.
9			** Comment 21c. The response to this comment is unacceptable as presented. It is important to maintain flow velocities to approximately 5 feet/second or less, as was discussed and agreed to in a prior OU 1-07B telephone conference. Either larger pipes or slow flows are needed to maintain acceptable flow velocities. Please revise the comment accordingly.	The 5 ft/sec value is used to mitigate water hammer. The other two factors that affect water hammer are 1) length of pipe and 2) system components that perform an immediate shutoff of flow. Since the length of pipe is less than 10 ft. and there are no auto shutoff components, the higher velocities are acceptable.
10			Comment 38. The proposed resolution to this comment included the statement that Section 3.2.1 will be revised to state that groundwater sampling will be conducted at a limited number of select wells (including the new MZMW) to provide data to assess NPTF performance. The actual section that discusses NPTF Capture Zone Performance Monitoring Requirements is Section 4.2.1, but there is no mention of the MZMW or sampling of a select number of monitoring wells. Please include the subject text in the correctly referenced section as was proposed in the resolution.	The proposed resolution to the original comment 38 was incorporated into Section 4.3.2 of the O&M Plan. This subsection is specific to NPTF Groundwater Monitoring. The change in section number where the resolution was incorporated was due to the need to re-number the entire section from 3 to 4, and to place the groundwater monitoring requirement into subsection 4.3, Groundwater Monitoring, rather than subsection 4.2.
11			Comment 40b. The resolution to this comment states that a statement regarding flexibility of the monitoring plan included in the introduction of the document may be useful. As data is compiled, particularly in regard to initial performance of the NPTF and evidence of plume stasis or recession is sought, groundwater monitoring requirements are likely to change.	The provision addressing flexibility and anticipated future modifications to groundwater monitoring strategies was incorporated as the second paragraph under Section 4.3, Groundwater Monitoring, of the O&M Plan. See also response to comment EPA 13 below.

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ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
			While there was verbal concurrence over the phone on this point no statement regarding flexibility was found in the text. It is important to include a statement in the document that reflects that the plan anticipates and will incorporate modification to the groundwater monitoring plan as data is compiled and new data requirements are identified. (JR)	
12			What is meant by the statement regarding modifications to the groundwater monitoring plan in Section 2 since it is mentioned as a consequence of selection of alternative remedial technology not as an inherent part of the plan itself.	Section 2 of the GWM Plan identifies in the second paragraph that the current monitoring and related DQOs were developed assuming ISB and NA are chosen as the remedies for the hot spot and distal zones, and that if this assumption changes then different DQOs may apply and the GWM Plan would be revised accordingly. The last paragraph of Section 2 identifies that the groundwater monitoring strategy may also change from the overall perspective of continuing data analysis and changes in plume dynamics. See also response to comment EPA 13 below.
13			Considering the proposed length of time between sample collection and analysis for many analytes under routine sampling schedule (as the statistical sampling analyses and number of locations is limited) flexibility to evaluate data requirements should be ongoing. Supplemental sampling activities should be discussed in the plan.	A statement has been made in the GWM plan that addresses this comment. Section 2, paragraph 2, lines 9 and 10 state "As changing data quality objectives (DQOs) are identified, the monitoring plan will be revised to modify or implement activities designed to address the new objectives." Section 2, paragraph 4, lines 4 and 5 state "Monitoring plans will be modified as appropriate based on continuing data analysis." Since the nature of future data analysis is unknown today it is not possible to specify specific supplemental sampling activity. Rather it is necessary to identify that a process is in place that allows modification of existing plans to meet changing monitoring needs. The Phase C GWM Plan as currently written achieves this goal.
14			Comment 40c. Information included in this response should also appear in the text of Section 3 of the Phase C Groundwater Monitoring Plan. A brief discussion of the sampling activities that will be performed under the ASTD program and	Agree. A new section "3.1.3 Supplemental Sampling" will be added to allow description of sampling programs conducted outside the CERCLA monitoring program. Vertical profile sampling and dissolved gas sampling are the only two

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			information on how these data will be dovetailed together to provide a comprehensive groundwater quality data set should be included in this plan. Please provide additional details to assure that the analytical parameters, analytical methods, collection techniques, and detection limits will be uniform between the two programs and that reporting requirements will incorporate and evaluate data from both programs.	"supplemental" activities planned. In both cases the OU 1-07B program is providing funds to cover procedure preparation, sample analysis, and QA/QC samples and analysis. This statement will be made in the document and will constitute CERCLA acceptance of these supplemental activities in terms of on-site activity management and waste management.
15			No revised draft final WMP was submitted with this package for review. If any changes have been made, a revised WMP should be submitted.	No changes were made to the Waste Management Plan.
16			The Interim Decontamination Plan does not describe how water/steam will be confined to the decontamination pad, especially if a high-pressure water rinse is used. Additional containment will likely be required to prevent release of water/steam beyond the decontamination pad.	The text will be changed to require that the use of this cleaning technique will require the preparation of a Work Plan detailing the methods used to prevent over spray due to high pressure washing. Work will not be allowed to proceed without approval by the projects field supervisor and industrial hygienist.
17			** The Operations and Maintenance Plan does not specify the sequence for the prefinal inspection, the shakedown, and the final inspection. While the final inspection may not be necessary, the Plan, as written, appears to show that shakedown and initial operations precede the final inspection. This sequence should be reversed; both inspections (if needed) should precede the shakedown and initial operations period.	A figure will be added which specifies the sequence of these activities. The sequence will show that a final inspection, if required, will be performed prior to shakedown and operations.
18			** The O&M manual, which is a separate document, should be available for review prior to the prefinal inspection. At that time, items in the list in Section 2.1 of the O&M Plan should be described in greater detail.	As currently stated in the O&M Plan Section 2.1, Page 2-1, the final O&M Plan and the operations manual will be provided to the agencies one month prior to the prefinal inspection.

PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: New Pump and Treat Facility 90 Percent Design, Draft Phase C Remedial Action Work Plan, and supporting documents for Test Area North Groundwater Remediation

DATE: September 16, 1999 **REVIEWER:** EPA

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
Interim Decontamination Plan				
1	3.3	3-1	Please list the MCP-425 unrestricted release limits which are the stated decontamination objective.	Type / Radionuclides / Removable (dpm) / Total (fixed + removable) (dpm) A — Transuranics, I-125K, I-129, Ac-227, Ra-226, Ra-228, Th-230, Pa-231 — 20 — 500 B — Th-nat, Sr-90, I-126, I-131 I-133, Ra-223, Ra-224, U-232 Th-232 — 200 — 1,000 C — U-nat, U-235, U-238, and associated decay products — 1,000 — 5,000 D — Beta-gamma emitters, except Sr-90 and others noted above. — 1,000 — 5,000 E — Tritium and tritiated compounds — 10,000 — N/A A statement will be added to the text that indicates that the project will not exceed the ROD limit of 1:10,000 cumulative carcenogic risk.
2	4.4	4-2 and 4-3	The decontamination method using non-phosphate detergent (described on page 4-6 for decontamination of down-hole equipment) is not included here. If this method will be used, it should be included in Section 4.4. Also, Section 4.4.5 briefly describes radiological survey as a decontamination method. Technically, this is not a decontamination method, but a means to verify whether decontamination is sufficient. A separate section should be included which describes both the radiological survey and the visual inspection methods. This section should include more detail, especially for the radiological survey, such as what type of equipment will be used, and the criteria for this survey. Further description of visual inspection is also appropriate; for example, will small areas of stain be acceptable, or will all stains and discoloration be removed to meet criteria?	a. Section 4.4.1 currently includes a discussion of the subject wipe down method. b. Agree. A radiologic survey is not a decontamination method. This sub-section will be made into a separate section in Section 4. A radiologic survey is the final step in the process dispositioning an item. This survey will be conducted in accordance with MCP-425. This procedure follows the guidelines set forth in 10 CFR 835, occupational radiation protection. c. A new section will be added to Section 4 which provides further clarification to visual inspection requirements. It shall state "for materials and equipment which have the possibility of coming into contact with the project COC will be subject to visual inspection prior to release. The performance criteria for

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ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
				these visual inspections are set forth in Section 3 of this plan. All materials and equipment which may require visual inspection prior to release shall be subject to a pre-use inspection which will note and document any stains or residue present prior to use by the project. The final release criteria is that no additional or new stains may be present for release."
Phase C, Groundwater Monitoring Plan				
3	4.1.2	4-1	This section discusses purging of the groundwater monitoring wells prior to groundwater sample collection using a Hydrolab or equivalent instrument to measure stabilization of field parameter prior to sample collection. The authors should include a statement in the text that the Hydrolab will be calibrated according to the manufactures specifications and that the calibration data will be recorded prior to commencement of pumping and purging operations.	Agree. This is covered in GW sampling TPR-165 and will be referenced in the GWMP.
4	4.2	4-4	This section describes waste management. The Waste Management Plan (WMP) should be referenced, since this section appears to add information not in the WMP, for example, that solid materials will be disposed of at WERF. All relevant information should be in the appropriate document, which is the WMP in this case.	Agree. The Waste Management Plan is the appropriate guide for waste disposition issues. The Waste Management Plan is referenced in this section, and guidance from the Waste Management Plan is provided. However, the third sentence in the second paragraph is misleading and will be revised to say; "This waste will be handled and disposed of in accordance with the OU 1-07B WMP and the WAC of the receiving facility."
O&M Plan				
4	3.1.1	3-4	Text states assumptions used to estimate that the maximum allowable NPTF downtime is 50 days. However, one assumption is that the natural gradient flow rate is "3 m/day (1 ft/day)." This is likely a typographic error; however, if the 3 meters per day is the intended flow rate, then the maximum allowable downtime is only 5 days (assuming that all other assumptions hold). Please correct any errors and show the correct allowable downtime. This section also refers to Appendix A for a spare parts list; Appendix A, which is labeled as a spare parts inventory, does	This is a typo. Text will be corrected.

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ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
			not include this list. Please show this list, even if items are added later on.	
5	4.1.1.4 & 4.1.1.5	4-4	** These sections show equipment and procedures for water and air sample collection, respectively. The text states that no standard operating procedures (SOPs) have yet been written. These SOPs should be included, possibly as an addendum to Appendix B (Sampling and Analysis Plan). Screening for Shipping SOPs should also be included.	As stated in Section 2.1 of this O&M Plan operational procedures will be prepared as part of the final NPTF O&M Plan to be submitted to the agency for review one month prior to the NPTF pre-final inspection.
6	4.2.1	4-5	The text states that "Barometric fluctuations of the potentiometric surface can interfere with determining steady state drawdown over an extended period of time." While it is true that barometric pressure fluctuations affect the elevation of the potentiometric surface, it is not clear to GF why turning the NPTF extraction system off and on is required to estimate the barometric influence on groundwater elevations. If, as stated in Section 4.2.1, the potentiometric surface is being measured over an extended period of time than recording barometric fluctuation of the atmosphere and comparison with coincident potentiometric elevation fluctuation can be used to normalize the barometric influences on the potentiomentric surface. By collecting these data over an extended period of time and comparing it to groundwater elevation fluctuations, the influence of barometric pressure can be estimated without turning the extraction system on and off. Considering the productivity of the SRPA, a steady state condition would be expected to occur relatively quickly and remain relatively stable over time. The authors should consider using barometric data as a means of normalizing the groundwater elevation data as opposed to turning the extraction system on and off which will interrupt the equilibrium of steady state conditions and result in potentiometric surface fluctuations.	No change necessary. The objective of water level measurements is to monitor the performance of the NPTF. This is best accomplished with the proposed change.

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ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
7	4.2.1.1, 4.2.1.3, & 4.2.1.4	4-5 & 4-6	These sections discuss the collection of groundwater elevation data which will be necessary to evaluate the plume dynamics as the extraction system comes on line and groundwater elevations stabilize. The first two sections discuss the frequency of groundwater elevation data as "...on two occasions..." and "...once per quarter for two quarters...". The proposed frequency of water level elevation measurements is not sufficient to readily identify groundwater elevation trends. The last section cited mentions that the groundwater elevation data will be collected using pressure transducers and data loggers. This type of equipment can be set up to acquire data over long periods of time at different frequencies and can be visited weekly for calibration and data acquisition. We suggest that the frequency of data collection be increased during the initial assessment of the effects of the NPTF on plume dynamics. The authors should consider installation of pressure transducers in several key monitoring locations (e.g., in, near, and far from the extraction wellfield) and begin collecting background data well in advance of the commencement of extraction activities. Observing long term trends prior to pumping may indicate seasonal fluctuation and/or localized effects on groundwater elevations as a result of pumping withdrawals from locations other than the NPTF. The transducers should then be left in these locations after the extraction activities begin and water levels measurements recorded at least daily until long term trends are established. The frequency of data collection can be modified as required and the data presented graphically for ease of interpretation.	NPTF water level measurements are a subset of annual water level monitoring. The purpose of NPTF water level monitoring is to assess performance of NPTF.
8	8.3	8-1	The text states that "A groundwater monitoring report will be prepared that discusses the analytical results from the current year's monitoring effort and presents a historical perspective of groundwater monitoring results."	Text changed to specifically indicate that monitoring reports will be prepared biannually and will include both groundwater analytical and elevation data.

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DATE: September 16, 1999 **REVIEWER:** EPA

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
			The authors should state whether or not this monitoring report will be an annual report, and whether it will incorporate groundwater analytical data as well as groundwater elevation data. The text in Section 7.3 of the Phase C Groundwater Monitoring Plan states that reporting will be on a biannual basis as that is the frequency of data collection.	
NPTF 90% Draft Final Design				
9	3	3-1 & 3-2	This section lists three level transmitters and three level control valves. Section 2.5 lists six level control features. The tie-in between these two sections, and corresponding drawings, in unclear. Specifically, the function of level control valve (LCV) 307 (listed in Section 3) is unclear, and it could not be located in drawings. Level switch-low (LSL) 33, 38, 39, and 40, as shown in extraction wells in drawing P1, are not listed in Section 3. LSL, and level switch-high (LSH) 306, also shown in Drawing P1 in the surge tank, is not listed in Section 3. Level transmitters (LT) 308 and 309 are shown in Drawing P2, but not listed in Section 3. Level transmitters 312, 315, and 316 are listed in Section 3, but not found on any drawings. These discrepancies require explanation.	Section 3 is simply a major component list. It is not a complete system parts list. Section 2.5 only discusses three level control features (level control in the tank and level control in both Air Stripper Sumps). LCV-307 is the control valve for the tank. It is shown on Drawings G-4, P-1 and P-10. LSL-33, 38, 39, 40, LSL-306 and LSH-306 will be added to the equipment list. LT-307, 308, and 309 are listed as LT-312, 315, and 316. Text will be changed to resolve discrepancy.
10	Table 4-1		This table should also show anticipated discharge concentrations based on the design influent water concentrations. This would help to demonstrate that this system will not exceed air emission parameters.	A column will be added listing the maximum discharge rate based on max concentration and max flowrate.
11	5	5-1	This section lists assumptions used in this design. The text should discuss consequences if one or more of these assumptions are false.	Text will be added as follows: "If any of these assumptions prove to be incorrect then a system evaluation will be performed and appropriate modifications will be made. The probability for any of these assumptions to be incorrect is very low."

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DOCUMENT TITLE/DESCRIPTION: New Pump and Treat Facility 90 Percent Design, Draft Phase C Remedial Action Work Plan, and supporting documents for Test Area North Groundwater Remediation

DATE: September 10, 1999 **REVIEWER:** IDHW/DEQ

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
NPTF Draft 90% Remedial Design				
1	2.1	2-2 Last Sentence in Section	The beginning of this sentence is unclear because it appears that the water is considered to no longer contain the listed hazardous waste as a result of the air stripping process. Even if the treatment system is successful in reducing hazardous constituent levels to below MCLs, the water will still contain a listed hazardous waste until a no-longer-contained-in is granted. Please rework this sentence to clarify this statement.	Text changed to the following: " . . . the water will be considered to no longer contain the listed hazardous waste. This is dependent on being able to obtain a NLCID from the State of Idaho. The water will then be discharged as clean water, . . ."
NPTF Draft 90% Remedial Action Plan				
General comment			Concerns have been raised regarding potential additional hazardous VOC and SVOC constituents in the TAN groundwater. The current air stripper design only considers four (4) VOC compounds. Due to actions at the source, surge and stress activities near the source and potential generation of constituents through ISB activities, additional previously unidentified compounds may exist. Identification of additional hazardous compounds in the groundwater could require a significant design change. Therefore, timely collection of groundwater samples for a minimum of VOC and SVOC compounds as listed in 440 CFR, Part 264, Appendix IX may prevent costly re-design or delays in the future. Please include plans for sample collection and analysis for these constituents.	Current monitoring plans include analysis of CLP VOCs with the addition of PCE/TCE degradation products (cis and trans 1.2-DCE, ethene, ethane, methane). This target list has been discussed with the agencies and will be used to evaluate NLCI requests on a cumulative risk basis. A statement regarding this approach will be added to the NPTF Draft 90% RAP. This comment also identifies a concern that a "significant design change" may be required if previously unidentified hazardous compounds appear in a treatment stream. As remediation of the source area proceeds the concern will be addressed. It is recommended that the concern be addressed through review of the SMO CLP analyte list (VOCs, and SVOCs) to identify subclasses of compounds that could reasonably be expected to cause a significant design change. Given this list, appropriate design changes can be identified at a conceptual level. The air stripper influent monitoring strategy includes the above referenced modified CLP VOC list and, in addition, the RAP will be modified to identify the CLP SVOC compound list (See EPA-540/R-94/073 USEPA Contract Laboratory Program SOW for Organic Analysis, Exhibit C) for air stripper influent samples. This strategy will identify possible future design changes, put in place appropriate timely monitoring to determine

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ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
				if and when design changes may be needed, and will minimize significant system design (and associated cost) prior to the demonstrated need for such design changes.

Appendix B-2

Document Review Comments and Resolutions
July 2003

PROJECT TITLE::OU 1-07B	POINT OF CONTACT:	E-MAIL	Reviewer's Name/Discipline:EPA/DEQ	Phone No.:
Comments resolved by:	Date:		Signature of reviewer accepting resolution of: ::::significant comments:	Date:
Document NPTF RAWP	Project Name: Work Plan for Test Area North Final Groundwater Remed.		REVISION:	ACCEPTANCE:

Item No.	Page No./ Section/Zone	Review Comment	Comment Resolution	Date: Initials:
EPA				
1	2-2 §2.1.1.1	How does this section address the requirement of Section 6.1.2 of the ROD Amendment concerning the operation of the ASTU? This requires more than integration and coordination	Text has been added to summarize activities that will need to be performed if contingency is invoked as specified in the ROD Amendment	
2	2-4 Table 2-2 3rd Col	Under remedy compliance, the text states "After the hotspot downgradient and cross gradient flux has been cut off....place the NPTF in standby and monitor all medial zone wells annually for five years..." In the opinion of Gannett Fleming, the sampling interval of a year should be reduced to six months during the initial year in order to verify that groundwater concentrations have not rebounded above the remedial action levels as result of the treatment system shutdown. (JR)	Agree with suggested sample frequency.	
3	2-4 Table 2-2 4th Col	Under the heading Medial Zone Completion Criteria, the text describes the long term operation of the time period where the "...NPTF reduces concentrations to RAOs, or until concentrations can be reduced to a level that will meet RAOs by using MNA 2095." Please include the criteria in this column that will be used in making the determination that concentrations in the plume's medial zone have been reduced to the point where MNA will achieve RAOs. (JR)	The criteria used to make this determination will be evaluated and presented at a later time (during the project periodic reviews). These criteria will be reviewed and approved by the Agencies prior to final acceptance.	
4	3-6 §3.3	What is the relationship between the O&M manual and the FFA/CO required O&M Plan? As written, there appears to be no minimum standards established for inspections?	The O&M Plan provides the requirements of the FFA/CO. Our use of an O&M manual provides the details of how the system will be operated. The O&M Plan identifies the inspection requirements that are applicable for the system. There are specific inspection procedures for the NPTF as included in the O&M manual.	
5	7-1 §7.1.2	Reference to the ROD Amendment concerning the NLCI determination (see Section 9.2.3 3rd Bullet) should be included here.	Reference to the ROD Amendment was added.	

Item No.	Page No./ Section/Zone	Review Comment	Comment Resolution	Date: Initials:
Idaho DEQ				
1	1-6 §1.3.1	Please correct the acronym “IDEQ” to DEQ	Text modified as suggested.	
2	2-2 §2.1.1.1	Please include a figure depicting the locations of the wells identified in this section so the reader does not have to find a separate document to view the spatial relationship of the wells.	Figure 1-1 replaced to include pertinent well locations.	
3	2-3 Table 2-1 Distal Zone MNA Compliance	The sample parameter needs to be updated to reflect the monitoring schedule in the MNA Workplan.	Table modified to match MNA Work Plan requirements.	
4	2-4 Table 2-2 Compliance Monitoring Remedy Compliance	The reference to influent concentrations below MCLs or reaching long-term steady state is too vague. DEQ would prefer a more specific definition of long-term steady state in the context it ensures RAOs are achieved.	The criteria used to make this determination will be evaluated and presented at a later time (during the project periodic reviews). These criteria will be reviewed and approved by the Agencies prior to final acceptance.	
5	2-4 Table 2-2	The center column refers to various sampling ports that will be used for compliance monitoring. It would assist the reader to include a schematic showing the relationship of the various sampling ports so the reader does not have to find a separate report to make this type of assessment. The last section in the center column, “Remedy Compliance”, states “After the hotspot downgradient and crossgradient flux has been cut off and when all COC influent concentrations into the NPTF are below MCLs or have reached a long term steady state condition, place the NPTF in standby and monitor all medial zone wells annually for 5 years to evaluate and determine if the RAOs can be achieved in the medial zone by 2095 without further operation of the NPTF.” The stated approach presents a concern that concentrations could be in a long-term steady state condition with concentrations well above the MCL for an extended period of time but could meet the MCL by 2095. This approach requires further discussion to ensure that this approach will indeed be protective of human health and the environment. As worded, it is not clear that this goal will be achieved under all circumstances.	Figure 1-2 added to show process flow and location of sampling ports. The criteria used to make this determination will be evaluated and presented at a later time (during the project periodic reviews). These criteria will be reviewed and approved by the Agencies prior to final acceptance.	

Item No.	Page No./ Section/Zone	Review Comment	Comment Resolution	Date: Initials:
6	2-5 §2.1.1.2 Table 2-3	Please include a figure depicting the locations of the monitoring wells identified in this table.	Figure 1-1 replaced to include pertinent well locations.	
7	4-5 §4.3	Please replace “IDEQ” with DEQ.	Text modified as suggested.	
8	4-5 §4.3.1	Please verify in the last sentence that “proceeding” is the intended term. It appears the proper term is processing. Please modify as needed.	Word should be processing. Text changed.	
9	A-13 Appendix A Table A-1	Although there is probably an issue with the ARARs noted in the ROD, the proper citation should be the Idaho Ground Water Quality Rule, which is IDAPA 58.01.11, and not the Drinking Water Rule, which is a different citation. The Agencies should discuss a possible fix to this issue.	Agree with issue and citation. Change will not be incorporated at this time. This change will be noted and possibly incorporated in the future if a change to the ROD Amendment is ever made.	

Appendix B-3

Comment Resolution Forms
April 2007

North Wind

COMMENT RESOLUTION FORM

Project Name: Test Area North, Final Groundwater Remediation, OU 1-07B, Idaho National Laboratory	**Document Owner:** Lee Nelson	**Phone Number:** 208-526-3093	**Reviewer's Name:** DOE, EPA	**Phone No.:**
Comments resolved by: North Wind, Inc.	**E-Mail Address:**	**Phone Number:** 208-528-8718		
Doc ID: DOE/ID-10679	**Document Title:** New Pump and Treat Facility Remedial Action Work Plan for TAN Final Groundwater Remediation, OU 1-07B		**Rev. No.:** 2 Draft	

Comment No.	Page No./ Section/Zone	Review Comment	Comment Resolution	Reviewer
1	General Comment	It is not clear what are the criteria for "mothballing" the New Pump and Treat Facility (NPTF) for treatment of the medial zone. The definition of the medial zone is based on concentrations of TCE in the groundwater from 1,000 to 20,000 ug/l TCE. However, the text implies that the NPTF will run until the MCL of 5 ug/l is met. Air strippers loose their efficiencies as the concentrations of contaminants decrease. There should be some point at which monitored natural attenuation (MNA) can replace the NPTF system. EPA proposes any average concentration of 100 ug/l in the three wells monitoring the medial zone (see additional discussion in the specific comments).	We agree with the comment. At the present time we do not have criteria in place for mothballing the NPTF. We would like to start working with the agencies to define the criteria. We plan to provide criteria options during next NPTF Annual Report. We also acknowledge DEQ's request that the criteria do not include averaging the 3 medial zone monitoring wells.	EPA
2	P. 1-8, Sect. 1.6, last paragraph	This section of the text discusses the NPTF operating cycles, "This will generally be the period of time in which the NPTF runs." Additional discussion of what the term 'generally' refers to in this discussion should be provided. The operating cycle should be determined by the total number of hours the unit is expected to be operational when the normal weekly treatment schedule is in place.	The information presented in this paragraph was revised to the following: The NPTF will operate from Monday at 9AM through Thursday at 4PM (79 hours) during each working week. For this period of time, a facility uptime of $\geq$90% will be maintained. The above statements were also added to Section 1.5 of the NPTF O&M Plan.	EPA

Comment No.	Page No./ Section/Zone	Review Comment	Comment Resolution	Reviewer
3	P. 2-2, Sect. 2.1.1.	At some time in the future, another rebound test should be performed to further refine the implementation of the NPTF. As data from the current approach is collected, it should be reviewed with an eye to evaluating the need for the NPTF. Allowing the system to rebound further prior to restart or averaging the concentration of TCE over the monitoring wells should be attempted. In addition, a discussion about continued use of the NPTF when the area of the medial zone is very limited should be undertaken.	See response to Comment #1.	EPA
4	P. 2-5, Table 2-2.	The remedy compliance discussion in the Compliance Monitoring column notes that when COCs "reached a long term steady state" the NPTF may be placed into standby. What is the definition of "long term steady state"?	See response to Comment #1.	EPA
5	Section 1.6, second bullet, page 1-8	Please provide a reference in the text as to the section or document which describes the established NPTF flushing procedure.	Text describing the established NPTF potable water flushing procedure was added to Section 3.2.12 in the NPTF O&M Plan and a reference to that section was included in Section 1.6 of the NPTF RAWP.	DEQ
6	Section 1.6, fifth bullet, page 1-8	Please provide a reference in the text as to the section or document in which specifics of compliance monitoring are described.	A reference to the NPTF Operations and Monitoring Plan (DOE-ID 2007) was added to the bullet.	DEQ

Comment No.	Page No./ Section/Zone	Review Comment	Comment Resolution	Reviewer
7	Section 1.6, sixth bullet, page 1-8	Please include a brief explanation in the text (either here or elsewhere in the document) as to why bis-chloromethylether is being deleted from the analyte list. The document should contain this rationale to justify the change in the monitoring strategy.	There will be no changes in the monitoring strategy. One contaminant, bis-chloromethylether, will be deleted from the risk calculation table. The following statements were added to the text: Bis-chloromethylether will be deleted from the VOC analyte list as a best management practice to reduce monitoring costs. All samples analyzed for bis-chloromethylether since the start of sample collection through present showed undetect results. Also, bis-chloromethylether analysis requires collection of an additional 1 liter of sample volume and performance of a separate analytical method.	DEQ
8	Section 2.1, table 2-2, page 2-5	a) This table is confusing to read because it includes some obsolete requirements. These should be deleted since the table is intended to show current monitoring requirements. The text in Section 2.1.1.2 (page 2-6) adequately describes the past requirements and the subsequent changes in strategy, so please delete the now obsolete references to monitoring drawdown once every 6 months to verify plume capture (in Columns 2 and 5). Only the current requirements should be included. b) The second item in Column 5 apparently refers to the CERCLA-required Five Year Review document. However, as written, the note leaves the reader with the impression that the Agencies may only receive periodic compliance monitoring and performance data once every five years which would be unacceptable should a problem arise during operations. Please re-work the note to better portray how compliance and performance data will be evaluated and any problems addressed.	a) Table 2-2 was revised to include only the current requirements. This included deleting information regarding plume capture monitoring and specifics about draw down tests. b) The note regarding periodic performance reports has been deleted.	DEQ

Comment No.	Page No./ Section/Zone	Review Comment	Comment Resolution	Reviewer
9	Section 2.1.1.2, last paragraph, page 2-6	Please add a well location figure so the reader is not forced to find another document to see where the noted wells are located.	A figure was added to this section.	DEQ